

SAN Configuration Guide

LSI Storage



QLogic SAN Configuration Guide for LSI Logic Storage

Version 2.0

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Introduction

The *QLogic SAN Configuration Guide for LSI Logic Storage* is a comprehensive resource for developers and consultants interested in deploying QLogic solutions.

How to Use This Guide

This guide provides detailed solution configurations and interoperability information, which allow you to deploy a QLogic-powered SAN. Updated versions of this guide can be downloaded from the QLogic website at: <http://www.qlogic.com/interopguide>.

End-to-end interoperability not only includes switches, host bus adapters (HBAs), and storage products; it also extends to the component level. Therefore, this guide includes detailed information outlining the exact configurations tested by QLogic and the procedures necessary to deploy a SAN.

For More Information

Over 50 million QLogic products have shipped inside servers, workstations, RAID subsystems, tape libraries, disk and tape drives. Powering solutions from the industry's leading storage network providers, the broad line of QLogic controller chips, HBAs, storage network switches and management software move data from storage devices through the network fabric to servers.

Additional QLogic resources can be found at the following locations:

Fibre Channel Host Bus Adapters

http://www.qlogic.com/products/fc_san_hostadapters.asp

Fibre Channel Switches

http://www.qlogic.com/products/fc_san_switchs.asp

QLogic Technical Support

<http://www.qlogic.com/support/>

Interoperability Guides from QLogic Press

<http://www.qlogic.com/interopguide/>

Statement of Support

QLogic understands the unique needs and complexities of each and every SAN. As a result, the QLogic SANtrack™ Service and Support Program provides customers with a flexible way to create a unique service and support package designed specifically to meet your distinct business requirements.

QLogic switch products allow a wide range of organizations to exploit the power of a SAN. Whether it's a fast growing small firm implementing a network with 10-20 devices or a Fortune 100 Corporation creating a large infrastructure with thousands of devices, QLogic SANtrack Service and Support Program effectively addresses either set of business requirements.

The SANtrack Service and Support Program is a diverse offering of a range of services including: Select and Prime service plans, Pre-Install Analysis, Installation, On-Site and Spare Upgrades. Customers may choose among the services that best meet the demands of their business. Most importantly, customers are assured complete satisfaction since QLogic and its qualified partners fully guarantee all products and services.

NOTE: For additional information on support, please see the QLogic website at:
http://www.qlogic.com/support/warranty_santrack.asp.

Test Philosophy

The QLogic SAN configuration test philosophy is broken down into two test levels:

- Application-level interoperability
- Device-level interoperability

Application-Level Interoperability Test

The application-level interoperability test ensures that applications such as backup/restore, LAN-free back-up, serverless backup, and server clustering will run as designed on a combinations of hardware components that are representative of customer configurations. At this level, the hardware configurations are, for the most part, complex and can involve numerous devices that differ by type, vendor and operating system. Since the objective of this test is to determine the feasibility of typical customer SAN solutions, not every function of the application can be tested. While the application-level interoperability test addresses the major functions of the application, successful completion of the test does not guarantee full interoperability. However, it does provide a reasonably high level of confidence that the application will function well in most SAN solution scenarios.

Device-Level Interoperability

The device-level and system integration test verifies functionality of the device with additional hardware and software. The interoperability and system integration test ensures conformance with the ANSI Fibre Channel (FC) standards and interoperability between servers and storage.

Server Interoperability

This ensures there are no problems between the HBA and the server. Potential problems, which may be found in this testing, include incompatibility between the HBA and server PCI chipsets, and conflicts between the HBA driver/BIOS setting and drivers/BIOS setting of other installed devices/adapters in the server.

Storage Interoperability

Storage devices such as disk arrays and tape devices are tested with SAN hardware and HBAs. This ensures compatibility between the end device and SAN hardware. Potential problems that may be found include improper LIP handling, AL_PA and Worldwide Name problems, jitter, and so on.

Application Device-Level Interoperability

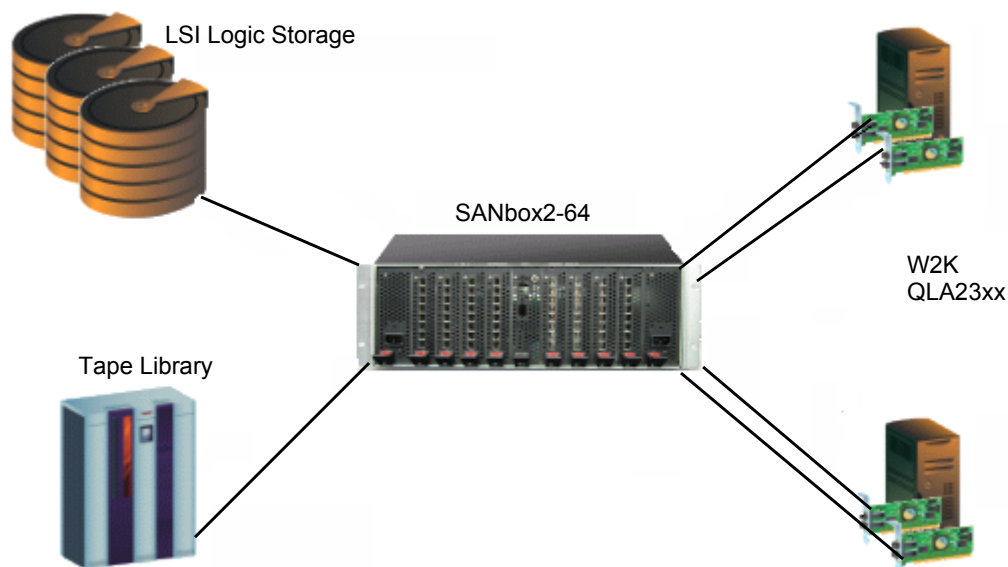
The application device-level interoperability test ensures coexistence with the operating system environment and typical user shrink-wrapped software. It also ensures that the software works with the applicable hardware. In the case of a Windows environment, the component should have successfully completed all applicable Microsoft Hardware Certification program tests.

Tested SAN Configurations

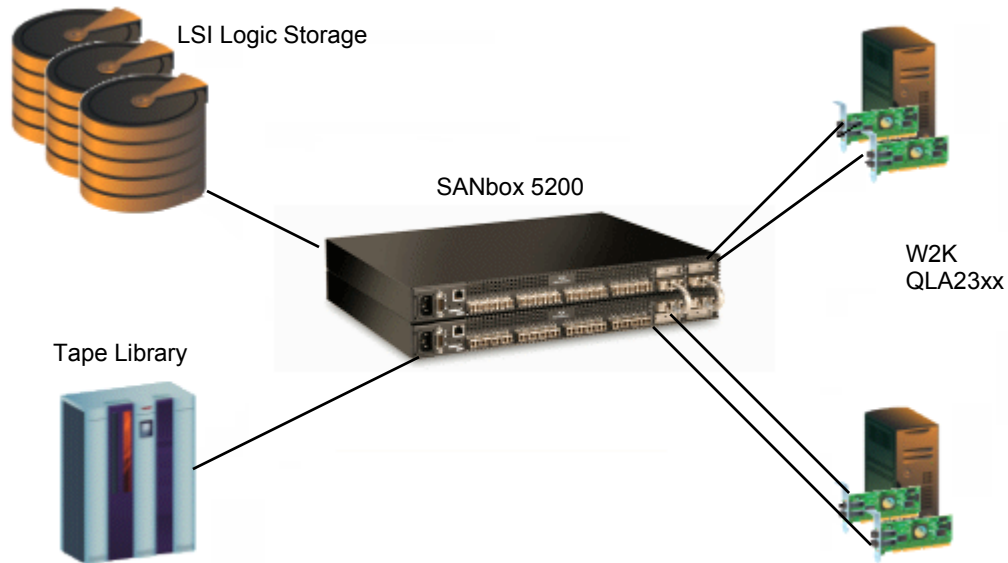
The following SAN illustrations show several different configurations and components certified by QLogic. Your configuration details may differ.

NOTE: For information on multi-vendor switch configuration, please see the *Switch Interoperability Guide* at <http://www.qlogic.com/interopguide>.

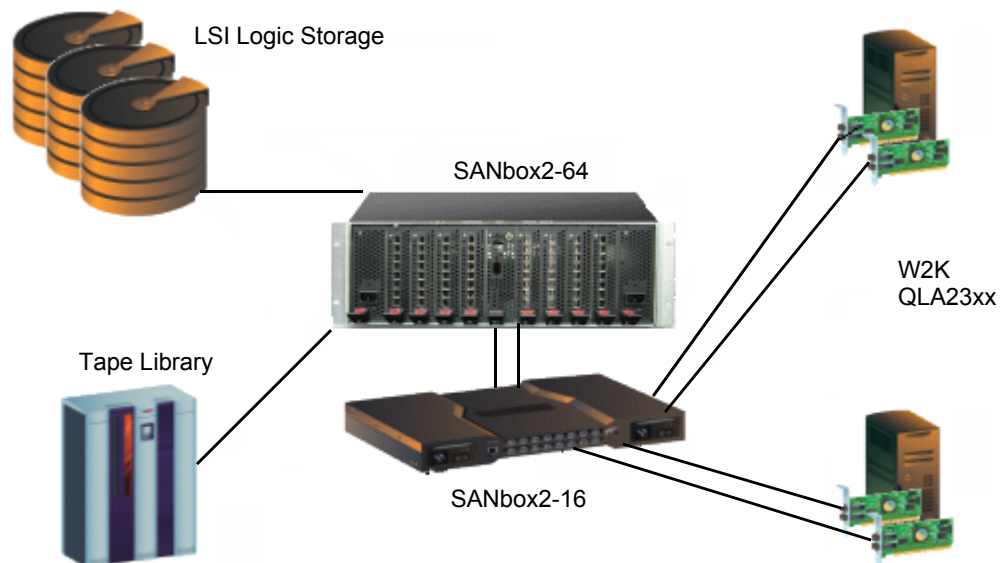
Single-Switch Configuration: SANbox2-64



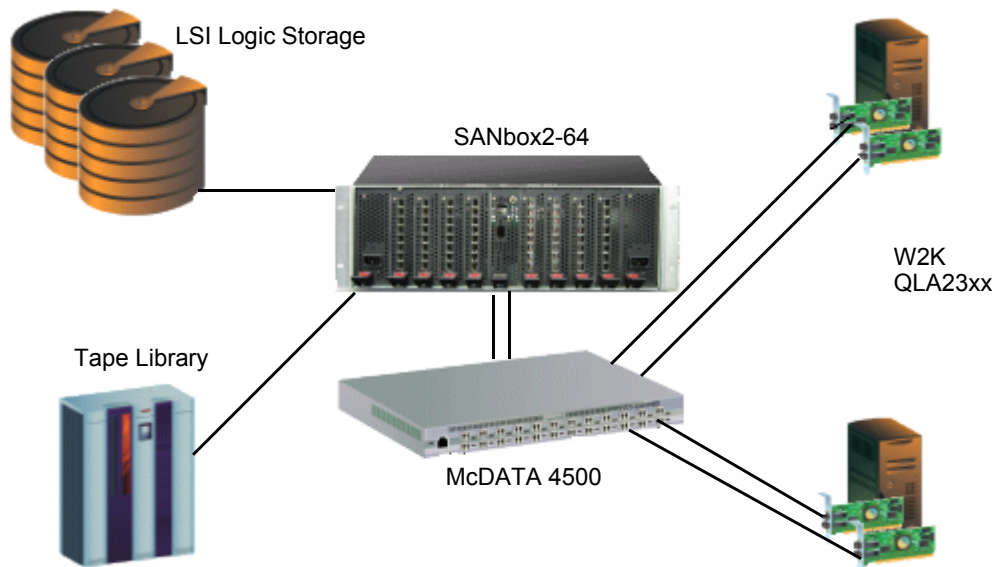
Cascade Configuration: SANbox 5200



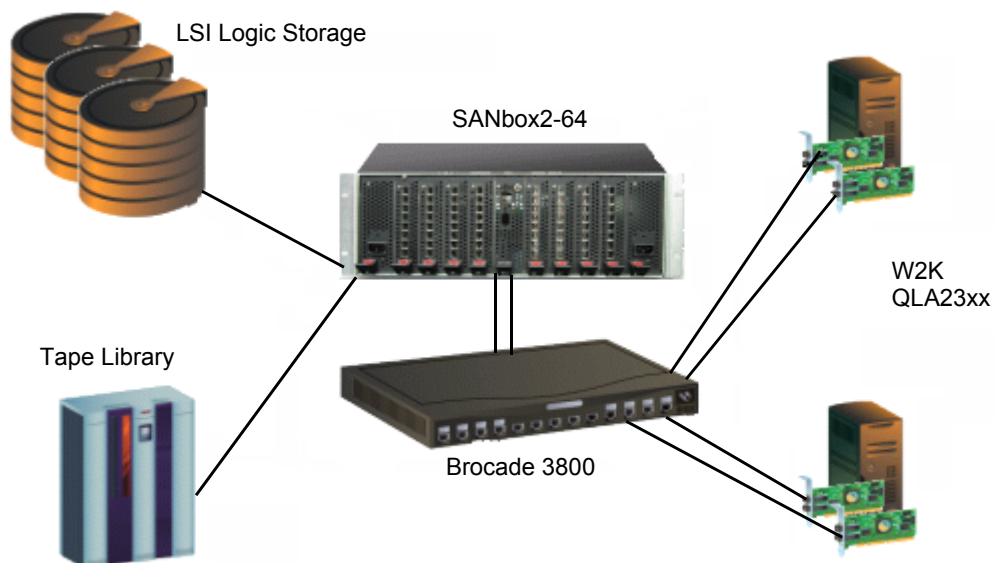
Cascade Configuration: SANbox2-16 and SANbox2-64



Cascade Configuration: SANbox2-64 and McDATA 4500



Cascade Configuration: SANbox2-64 and Brocade 3800



Driver and Firmware Levels

The following driver and firmware levels were used during QLogic certification testing. As new levels of software are released, they will be supported. See the QLogic website for the latest drivers, software, and manuals: http://www.qlogic.com/support/drivers_software.asp.

QLogic SANblade HBAs

Model	Windows Driver	BIOS
QLA2310	8.2.3.11 or above	1.33 or above
QLA2340	8.2.3.11 or above	1.33 or above
QLA2342	8.2.3.11 or above	1.33 or above

Switches

Manufacturer	Model	Firmware	SANbox Manager
QLogic	SANbox 5200	4.0.0.11 or above	4.00.10 or above
QLogic	SANbox2-64	1.5.0.07 or above	1.05.14 or above
QLogic	SANbox2-16	1.5.0.07 or above	1.05.14 or above
QLogic	SANbox2-8	1.5.0.07 or above	1.05.14 or above
McDATA	Sphereon 4500	040102 4 or above	Not applicable
Brocade	Silkworm 3800	3.0.2J or above	Not applicable
Brocade	Silkworm 3200	3.0.2J or above	Not applicable

LSI Logic Storage

Model	Controller	Firmware
E2400	2772	05.30.06.00 or above
E2600	2882	05.33 or above
E4600	4884	05.30.06 or above
E5600	5884	05.30.06 or above

Application Software

Application	Vendor	Version
SANsurfer™ Management Suite CD	QLogic	2.0.23 or above
SANbox® Manager	QLogic	1.05.14 or above (SANbox2 Series) 4.00.10 or above (SANbox 5200 Series)
SANblade™ Manager	QLogic	2.0.23 or above
SANtricity™ Storage Manager	LSI Logic	08.30 or above

Operating Systems

Operating System	Version	Service Pack/Patch
Microsoft Windows	2000 Server	SP3 or above

Libraries and Tape Drives

Manufacturer *	Model	Microcode
ADIC	Scalar 100 Library	2.72.0012 or above
ADIC	SNC 5100 Bridge	0410.14 or above
IBM	ULT3583-TL Library	4.20.25 or above
IBM	ULT3580-TD1 Tape Drive	25D4 or above
IBM	SAN Data Gateway Bridge	4.20.25 or above
SeagateLTO	Viper 200 LTO Tape Drive	1440 or above

* These libraries and tape drives were tested during QLogic certification but procedures are not available. Please check with your tape or library vendor representative for more information.

SAN Setup and Configuration

The following section of the *QLogic SAN Configuration Guide for LSI Logic Storage* provides instructions to set up and configure your storage, servers, and storage network. Once you have completed these steps, additional procedures illustrate how to connect the host and storage ports to the networks and how to validate your storage network connections.

In most cases, the SAN setup and configuration proceeds in this order:

1. [Storage Configuration](#)
2. [Server Configuration](#)
3. [Storage Network Configuration](#)

After configuration, complete the process by:

- [Testing Your SAN](#)

Storage Configuration

This section outlines configuration procedures for the LSI Logic E-Series storage systems.

LSI Logic Storage Overview

The LSI Logic E-Series is a suite of full Fibre Channel systems focused on high performance computing and open systems environments. The LSI Logic controllers that power the E-Series systems share a common firmware for seamless migrations.

The series includes these models:

- The E2400 is an entry-level system powered by the 2772 controller. Its full-fibre design and the 2772 controller offer modular flexibility for either independent capacity or performance scaling. It features a 1 Gb/s Fibre Channel and migration paths to other LSI storage systems.
- The E2600 storage system is a full 2 Gb/s solution with a modular architecture and enterprise-class features. Its 2882 controller offers four host connections and up to seven additional drive modules.
- The E4600 provides eight 2 Gb/s host connections and up to 33 TB capacity for demanding, bandwidth-intensive applications, like databases and OLTP. A dual 4884 controller powers this fully featured storage system to ensure high I/O performance.
- The E5600 solution delivers peak throughput for high performance computing environments. Powered by a dual 5884 controller, the 5600 is a fully redundant system optimized for high-speed, disk-based performance.

For more information about LSI Logic storage solutions, see the LSI Logic website.

LSI Logic E-Series Storage Systems

<http://www.lsilogicstorage.com/products/eseries.html>

LSI Logic E2400 Product Information

<http://www.lsilogicstorage.com/products/e2400.html>

LSI Logic E2600 Product Information

<http://www.lsilogicstorage.com/products/e2600.html>

LSI Logic E4600 Product Information

<http://www.lsilogicstorage.com/products/e4600.html>

LSI Logic E5600 Product Information

<http://www.lsilogicstorage.com/products/e5600.html>

E-Series Configuration

The following sections describe how to configure the LSI Logic E-Series storage systems:

- [Assumptions](#)
- [Configuration Steps](#)

Assumptions

The following procedures assume that:

- You have available storage space of suitable size for the application being used.
- You have already installed the SANtricity management application on a management system.
- You have assigned an IP address to the array.
- Your device is currently connected to the LAN on the same subnet as the management system.

Configuration Steps

Completing these steps will prepare the allocated storage for connection to the fabric:

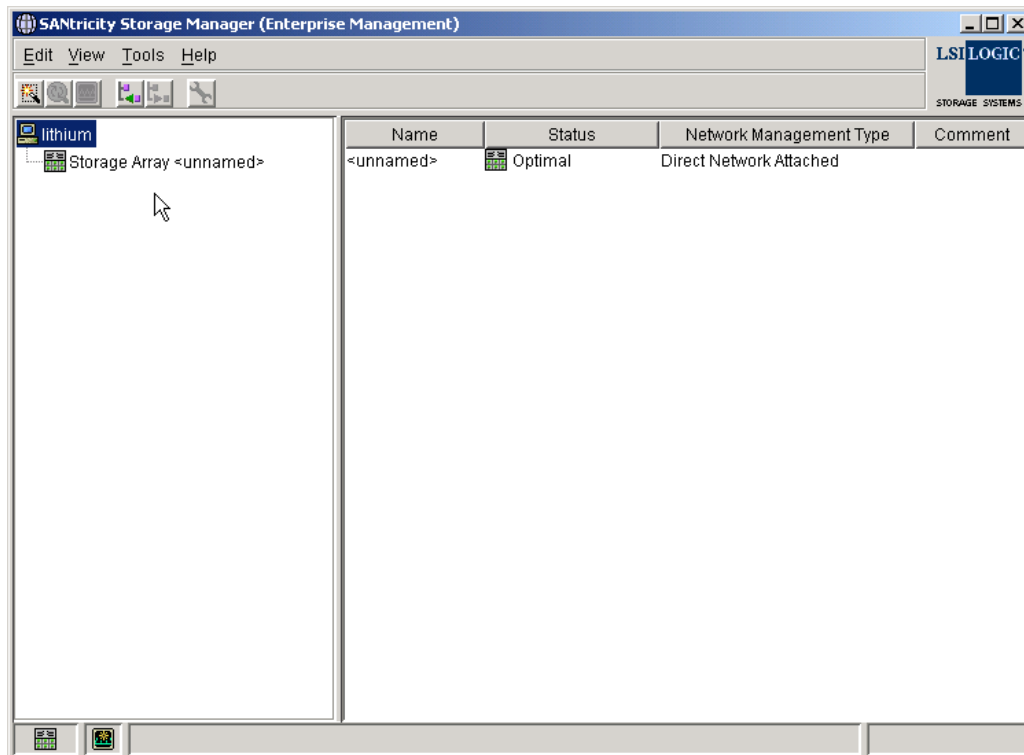
- [Discovering Devices](#)
- [Renaming the Storage Array](#)
- [Creating a Volume](#)

NOTE: Although you can follow these configuration steps for all E-Series storage systems, the steps are illustrated using only the E2400 model.

Discovering Devices

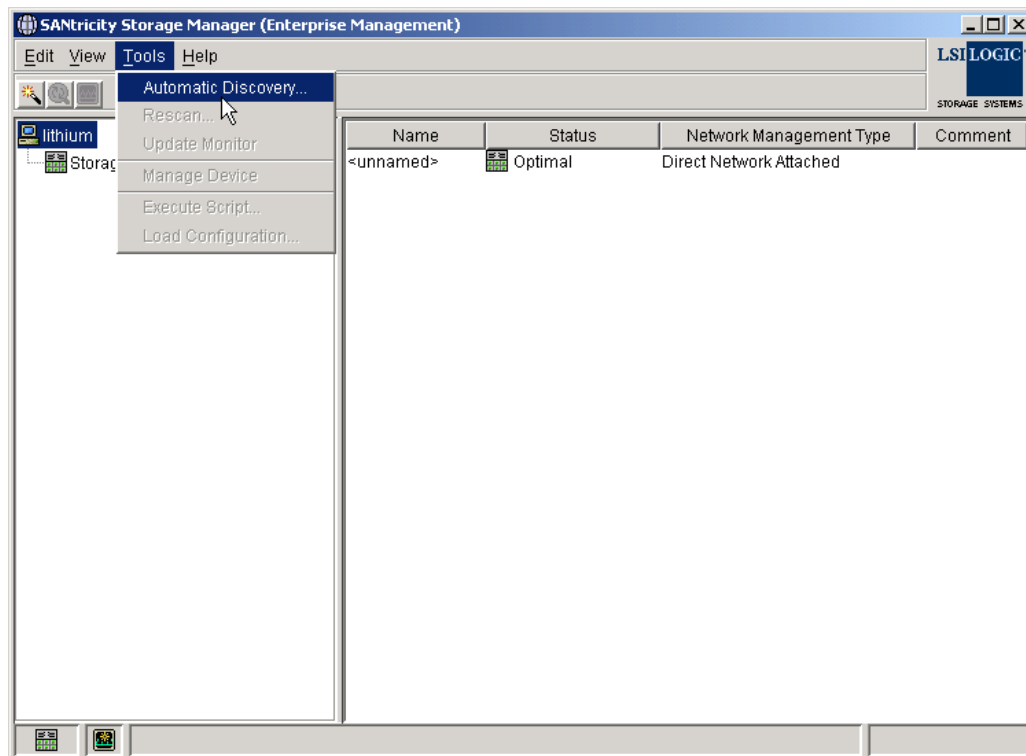
To discover the storage device, follow these steps:

1. Open the SANtricity Storage Manager Client Application.
2. The SANtricity Storage Manager opens and automatically detects the storage array on the LAN:

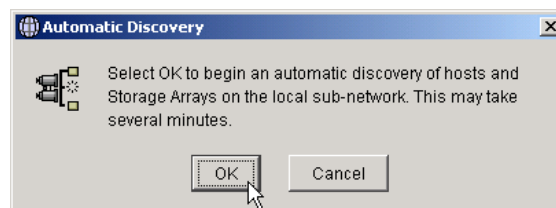


If the application detects the device, skip to step 5. Otherwise, continue with steps 3 and 4 to discover the storage array.

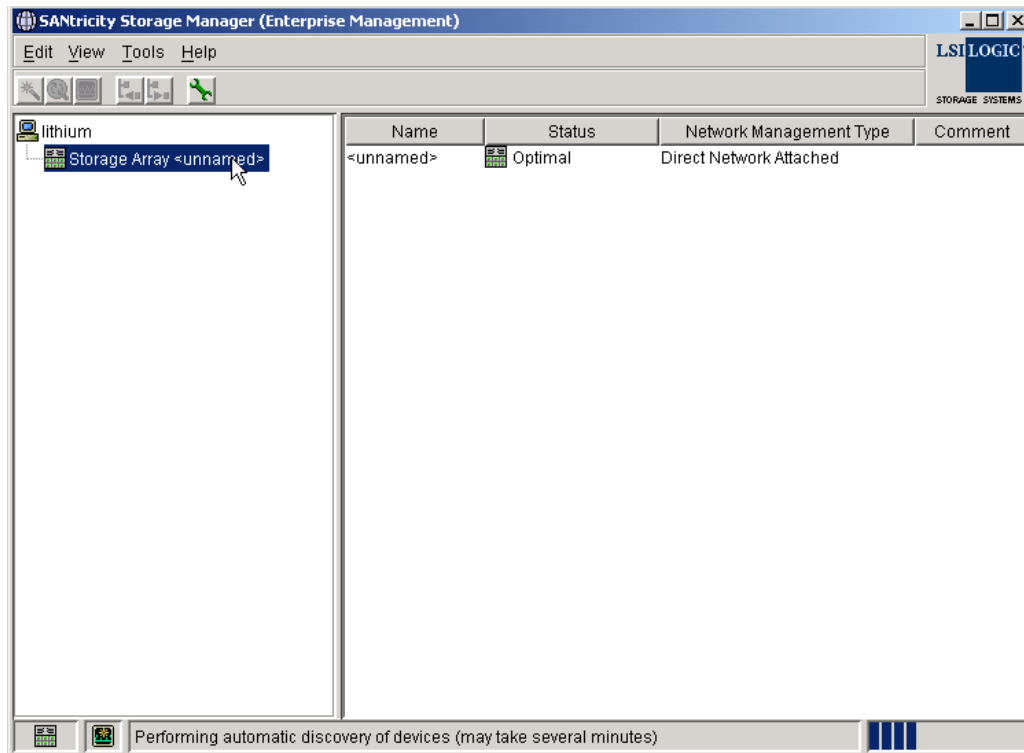
3. If the application does not begin to auto-discover the device, select **Automatic Discovery** from the **Tools** menu:



4. Select **OK** to begin the automatic discovery of the Storage Array:



5. Double-click **Storage Array** in the left frame to open the Array Management window:

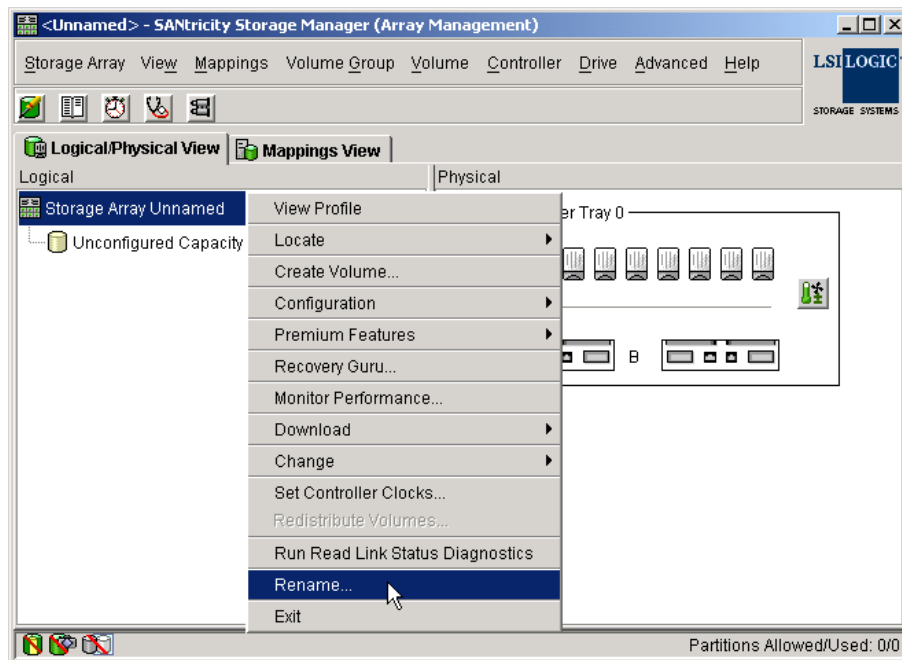


Renaming the Storage Array

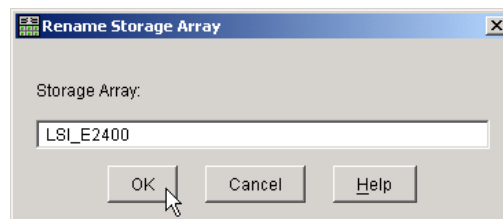
To rename the Storage Array, follow these steps:

NOTE: If you have already named the Storage Array, skip this section and see “Creating a Volume” on page 26.

1. Choose **Rename** from the Storage Array menu:

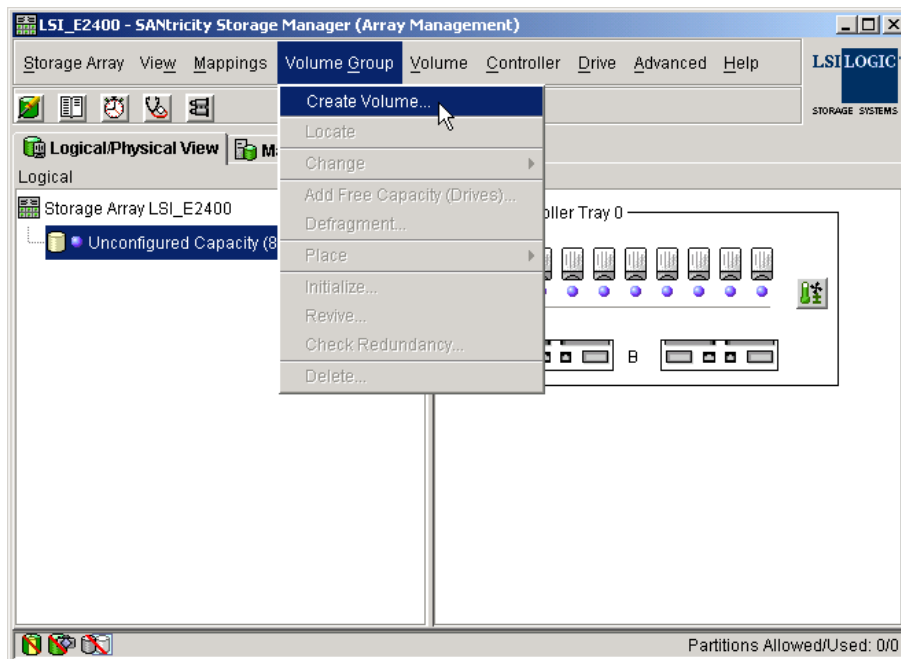


2. Type a name in the **Storage Array** field and click **OK** to apply:

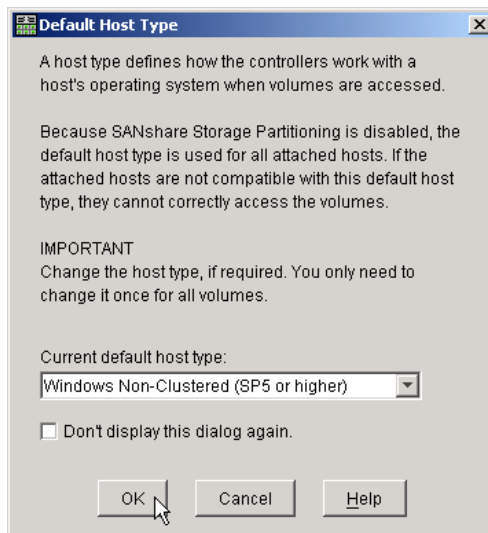


Creating a Volume

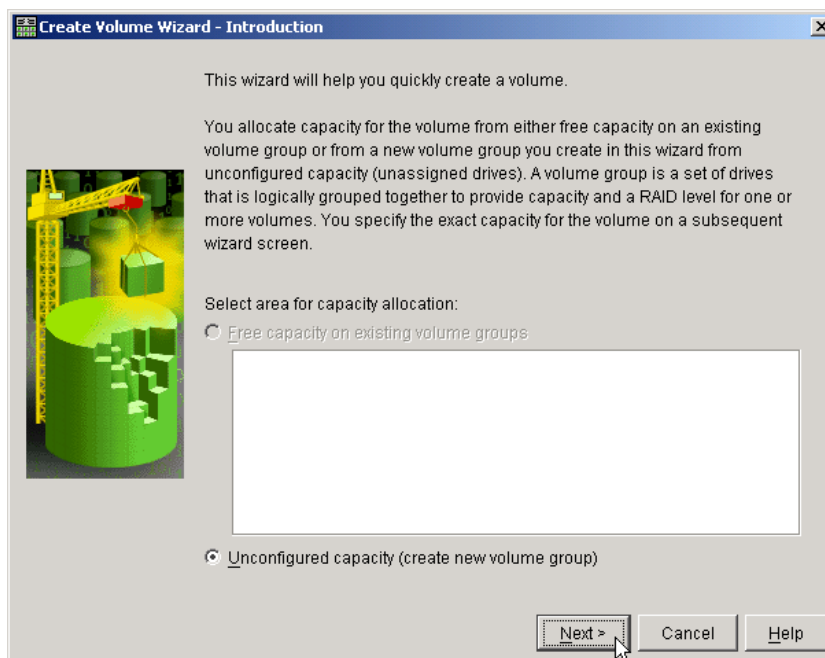
1. From the Storage Manager window select **Create Volume** from the Volume Group menu:



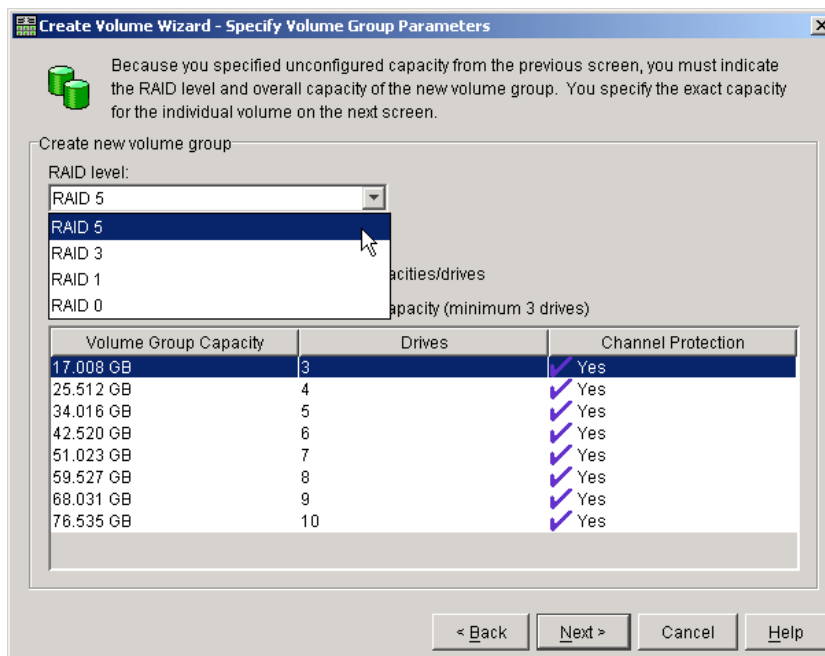
2. Select the host type from the drop down menu (such as UNIX, Windows Cluster, Windows Non-Cluster) and click **OK** to apply:



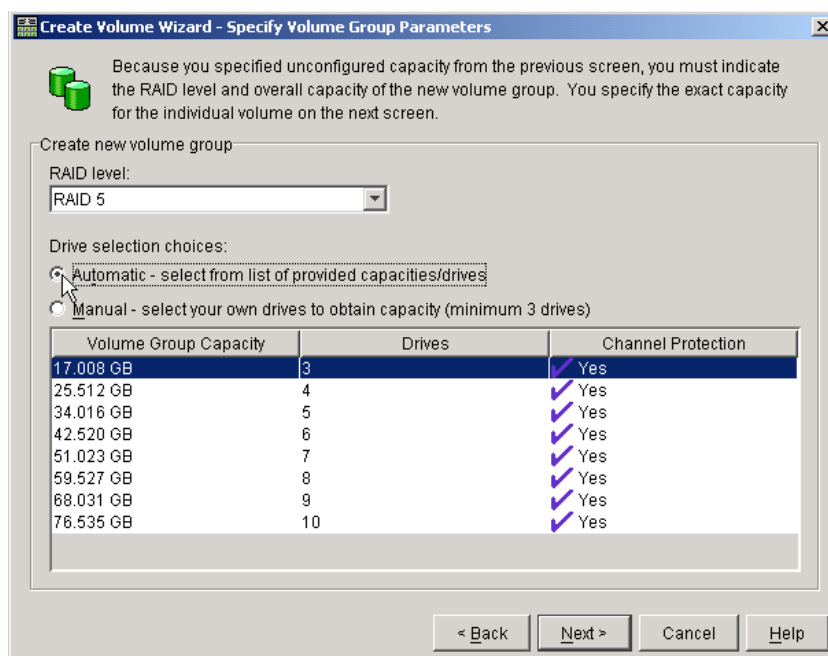
3. Create a new volume group by selecting **Unconfigured capacity (create new volume group)** and click **Next** to continue:



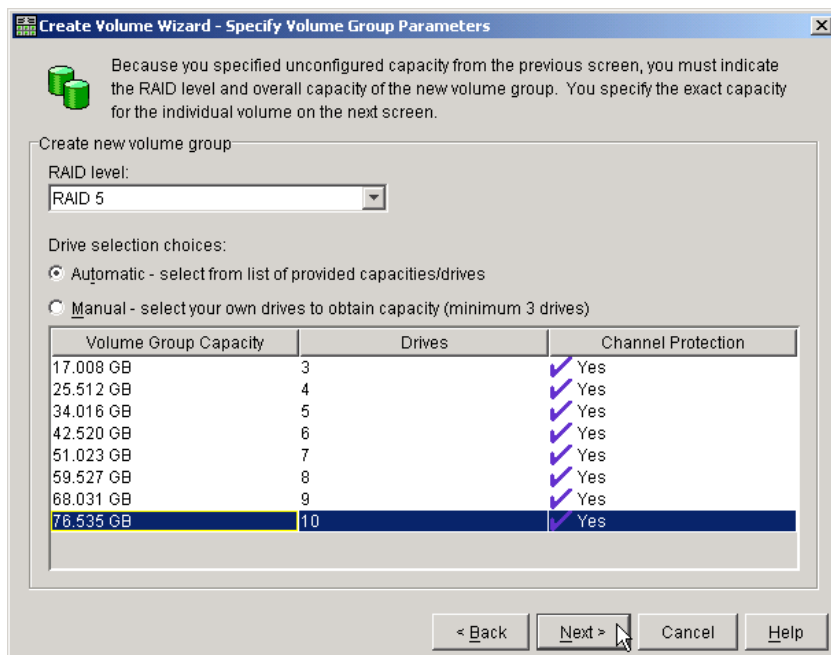
4. Select a **RAID level** from the list:



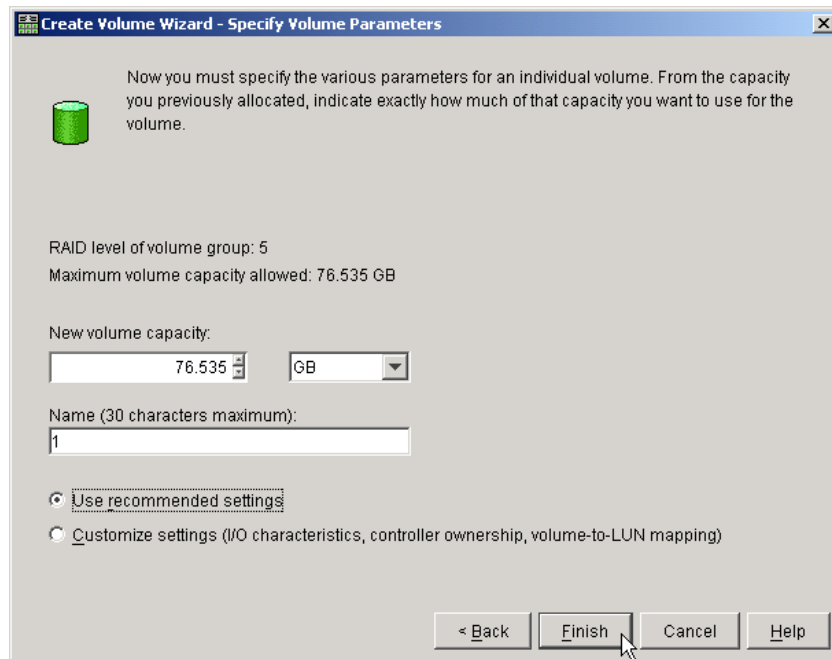
- Under Drive Selection Choices select **Automatic**:



- Choose the Volume Group Capacity desired by clicking the appropriate configuration and then click **Next**:



7. Assign the desired capacity of the Volume Group as follows:
 - a. Specify a value for the **New Volume Capacity**.
 - b. Type a Name for the volume (optional).
 - c. Click **Use Recommended Settings** for your volume characteristics.
 - d. Click **Finish** to save your changes:



Create Volume Wizard - Specify Volume Parameters

Now you must specify the various parameters for an individual volume. From the capacity you previously allocated, indicate exactly how much of that capacity you want to use for the volume.

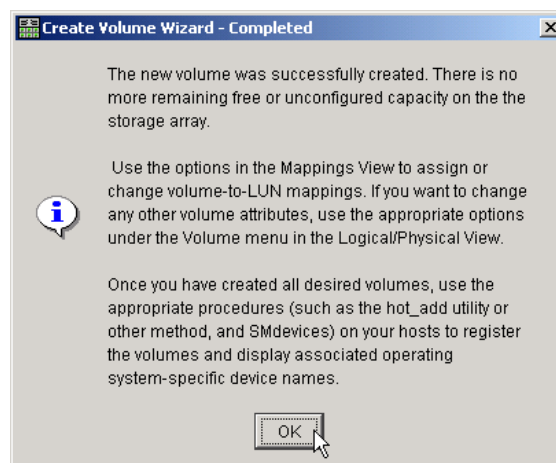
RAID level of volume group: 5
Maximum volume capacity allowed: 76.535 GB

New volume capacity:

Name (30 characters maximum):

☒ Use recommended settings
☐ Customize settings (I/O characteristics, controller ownership, volume-to-LUN mapping)

8. Click **OK** to close the Create Volume Wizard.



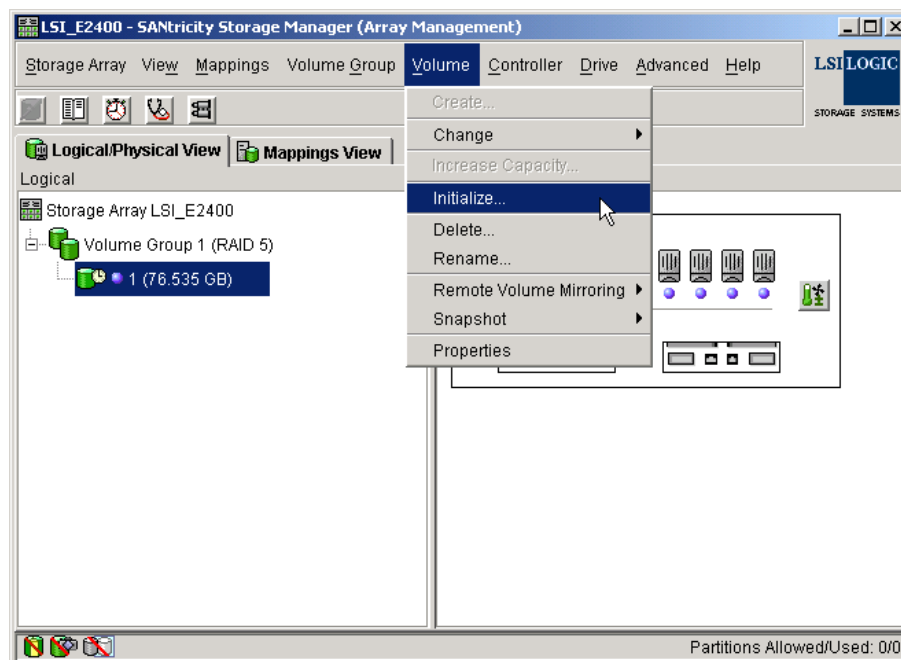
Create Volume Wizard - Completed

The new volume was successfully created. There is no more remaining free or unconfigured capacity on the storage array.

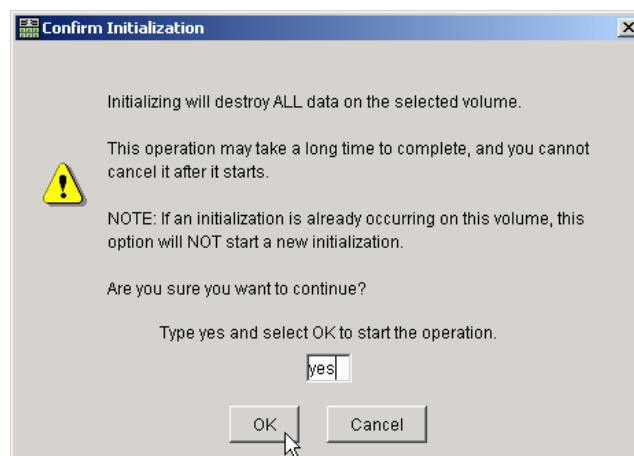
Use the options in the Mappings View to assign or change volume-to-LUN mappings. If you want to change any other volume attributes, use the appropriate options under the Volume menu in the Logical/Physical View.

Once you have created all desired volumes, use the appropriate procedures (such as the hot_add utility or other method, and SMdevices) on your hosts to register the volumes and display associated operating system-specific device names.

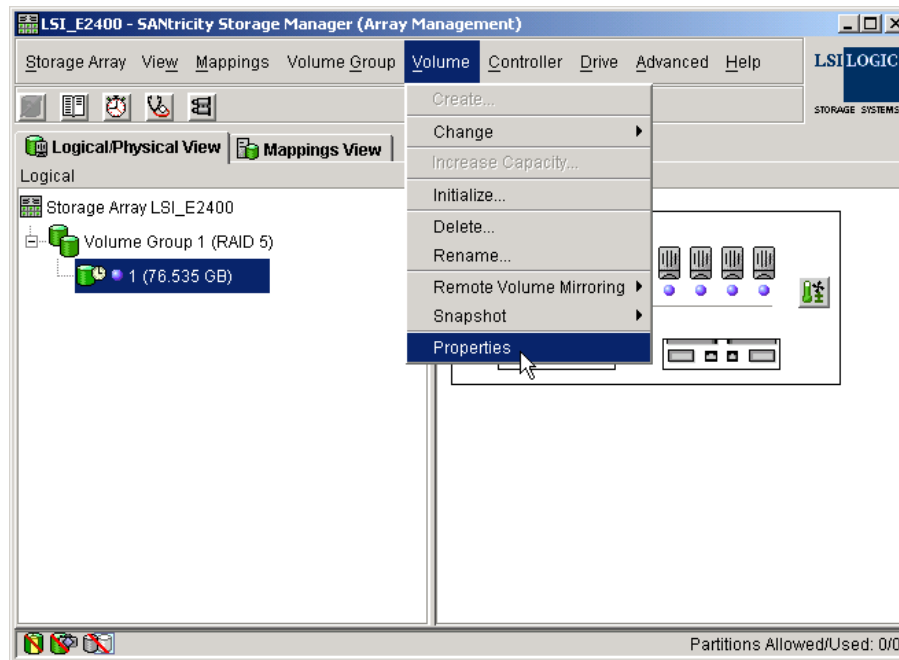
9. In most cases, the new volume begins to initialize automatically. If not, select **Initialize** from the **Volume** menu.



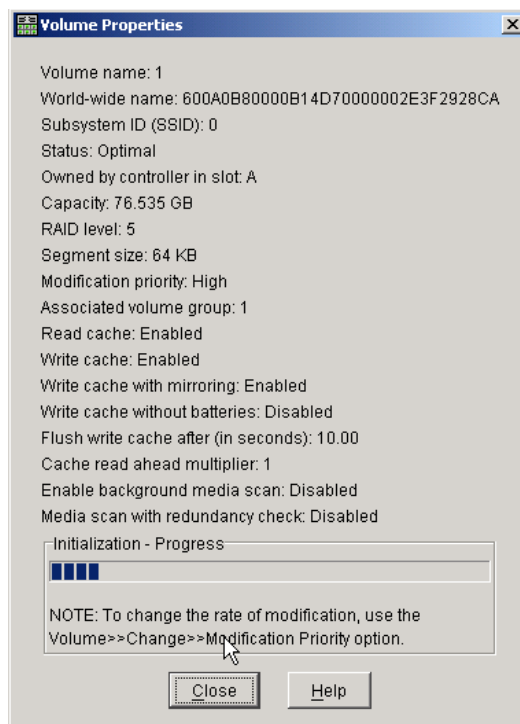
10. At the prompt, type **yes** to confirm that you want to initialize the volume and click **OK** to begin:



11. To monitor the initialization progress, select the volume and click **Properties** on the Volume menu:



12. Use the blue progress bar to monitor the initialization process or click **Close** to exit the status window:



13. Once the initialization process completes, you can detect and format your new volume.

For instructions to further configure the storage device, see the product manuals provided by your vendor.

Server Configuration

This section walks you through the steps needed to ready your server for connection to the storage network, including information on:

- Fibre Channel HBAs from QLogic
- Installing and configuring HBA drivers
- Installing the HBA and switch device management application (SANsurfer Management Suite)
- Configuring the HBA with appropriate settings

Once you have completed the steps in this section, you can continue to set up the storage network and connect the server to the fabric.

Fibre Channel HBAs Overview

The award-winning QLogic SANblade 2300 Series Fibre Channel HBAs offer 2Gb performance for demanding SANs and are available in PCI-X form factor, which is backwards compatible to PCI. QLogic SANblade HBAs are the industry's highest-performing and most widely deployed host adapter solutions for server, networking, storage and clustering solutions.

The SANblade 2300 Series architecture is the result of more than 15 years of progressive development and testing. The QLogic proven architecture delivers higher overall reliability and enables advanced functionality with its single chip integration, placing QLogic years ahead of its competitors. The SANblade 2300 also has proven interoperability with all major software applications, hardware platforms and operating systems.

The QLogic QLA23xx HBAs tested with the LSI Logic storage systems are:

- QLA234x
- QLA2310

Assumptions

The following procedures assume that:

- You have installed the HBA device into the system according to specifications in the hardware installation guide provided with the HBA. For more information, see the SANblade user manual at: http://www.qlogic.com/support/home_resources.asp?id=76.
- Your operating system and appropriate patches have been installed to meet the software and driver requirements for all components. For more information, see "Driver and Firmware Levels" on page 17.

Installing HBA Drivers

The following sections illustrate how to:

- Windows 2000 HBA Driver
- Windows 2000 HBA Pseudo LUN Driver

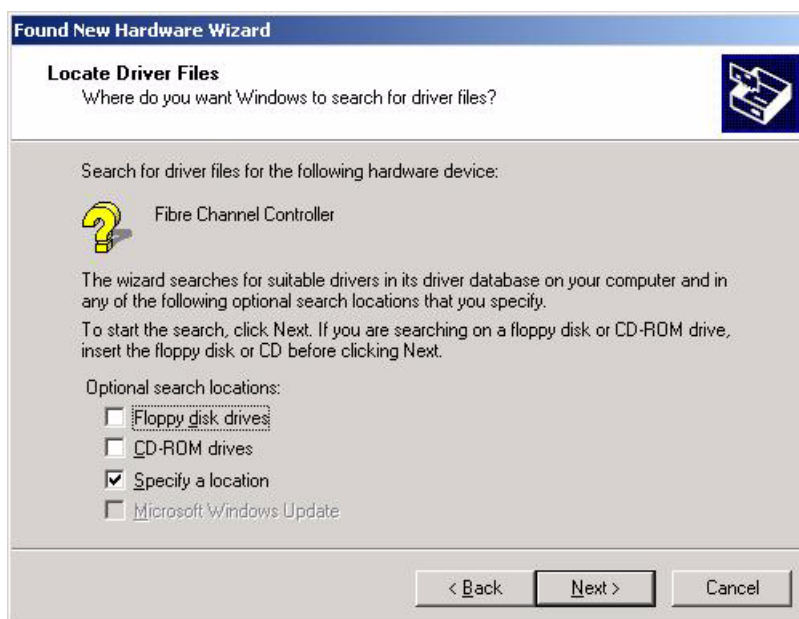
Windows 2000 HBA Driver

The QLA23xx HBAs are plug-and-play devices automatically detected by Windows 2000.

1. Download the latest driver from the **Download** section of the QLogic website (http://www.qlogic.com/support/drivers_software.asp) and extract them.
2. Windows 2000 detects the newly installed device, then displays the Found New Hardware Wizard message. Click **Next** to begin the driver installation.
3. When prompted, select **Search for a suitable driver for my device (recommended)** and click **Next**.



4. Check **Specify a location** and click **Next**:



5. Browse to the directory containing the driver and click **OK**:



6. When the **Driver Files Search Results** display, click **Next**:



7. Click **Finish** to complete the installation.

Windows 2000 HBA Pseudo LUN Driver

Windows 2000 detects the newly installed device automatically.

1. Click **Next** to begin the driver installation from the Found New Hardware Wizard message.
2. When prompted, select **Search for a suitable driver for my device (recommended)** and click **Next**.
3. Check **Specify a location** and click **Next**.
4. Browse to the directory containing the driver and click **OK**.

- When the **Driver Files Search Results** display, click **Next**:



- Click **Finish** to complete the installation.

Solaris HBA Driver

- Install the QLA23xx HBA.
- Power up the computer.
- Download the latest driver from the **Download** section of the QLogic website (http://www.qlogic.com/support/drivers_software.asp) and uncompress the file using the **uncompress** command.
- Follow the example below to install the driver:

```
sodium:/qlogic-> uncompress qla2300_pkg_v406.Z
sodium:/qlogic-> pkgadd -d ./qla2300_pkg_v406
```

The following packages are available:

- | | | |
|---|-----------|--|
| 1 | QLA2300-1 | QLogic QLA2300 driver |
| | | (sparc) Solaris 2.6, Rev=4.06 |
| 2 | QLA2300-2 | QLogic QLA2300 driver |
| | | (sparc) Solaris 7, Rev=4.06 |
| 3 | QLA2300-3 | QLogic QLA2300 driver |
| | | (sparc) Solaris 8-9, Rev=4.06 |
| 4 | QLSDMLIB | QLogic SDM Library |
| | | (sparc) Solaris 7-8-9, Rev=2.02 |
| 5 | QLSDMLIB6 | QLogic SDM Library |
| | | (sparc) Solaris 2.6, Rev=2.02 |
| 6 | scfx2-6 | QLogic SANblade Control FX (HBA Configuration Utility) |

```
(sparc) Solaris 2.6, 7 Rev=1.18
7 scfx2-8 QLogic SANblade Control FX (HBA Configuration Utility)
(sparc) Solaris 8-9 Rev=1.18

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]: 3 (choose the correct driver for your OS
version.)

Processing package instance <QLA2300-3> from </qlogic/qla2300_pkg_v406>

QLogic QLA2300 driver
(sparc) Solaris 8-9, Rev=4.06

Copyright (c) 1996-2002, by QLogic Corporation. All rights reserved.

Where do you want the driver object installed (default=/kernel/drv): <Hit Enter>
## Executing checkinstall script.
Using </> as the package base directory.
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

This package contains scripts which will be executed with super-user
permission during the process of installing this package.

Do you want to continue with the installation of <QLA2300-3> [y,n,?] y

Installing QLogic QLA2300 driver as <QLA2300-3>
## Installing part 1 of 1.
/kernel/drv/qla2300
/kernel/drv/qla2300.conf
/kernel/drv/sparcv9/qla2300
[ verifying class <none> ]
## Executing postinstall script.
Reboot client to install driver.

Installation of <QLA2300-3> was successful.
```

SANsurfer Management Suite

The SANsurfer Management Suite CD contains both the SANblade Manager (HBA management) and SANbox Manager (switch management). These applications are used to configure the QLogic HBAs and switches.

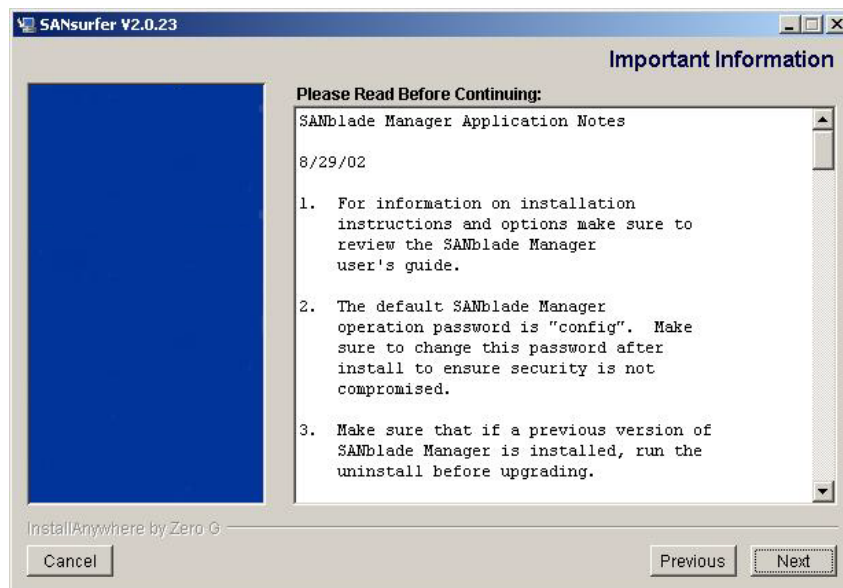
The following procedures show you how to install both SANbox Manager and SANblade Manager, though you use only the SANblade Manager at this time. When you configure switches later, you can access the SANbox Manager.

Installing SANsurfer Management Suite on Windows

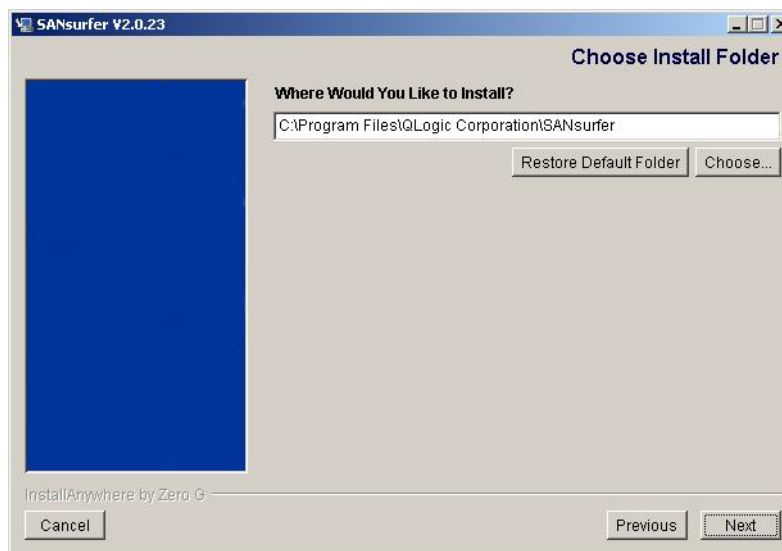
1. Download the latest version from the Download section of the QLogic website (http://www.qlogic.com/support/drivers_software.asp) and double click the icon to start the installation.
2. When the Introduction dialog displays, click **Next**.
3. Select the option to install **Both GUIs (Blade/Box) and Agent**. Click **Next**.



4. Read the **Application Notes** carefully and click **Next** when you're ready:



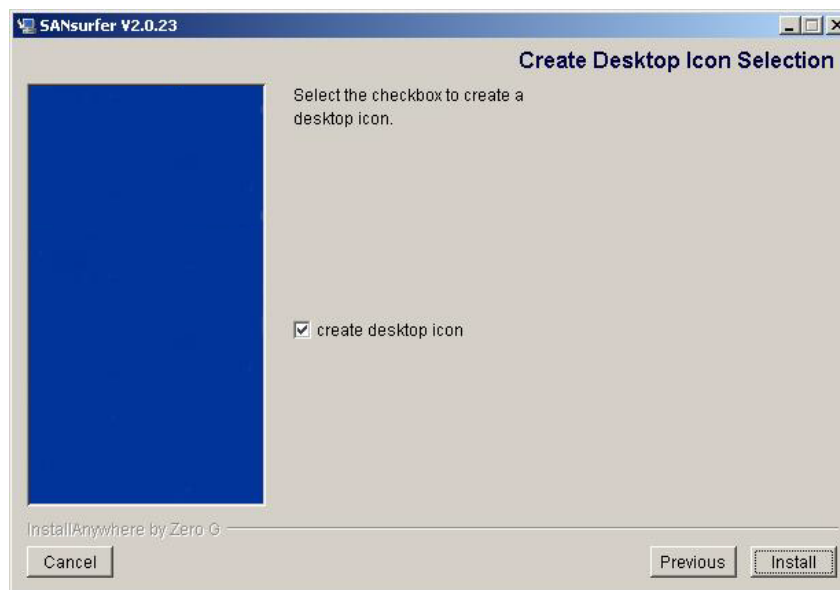
5. Edit the path where you want to install the software or click **Choose** and browse to the location. Click **Next**:



6. Select the **Shortcut Profile** you wish to use. Click **Next**:



7. Check **Create a Desktop Icon** if you wish. Click **Install**:



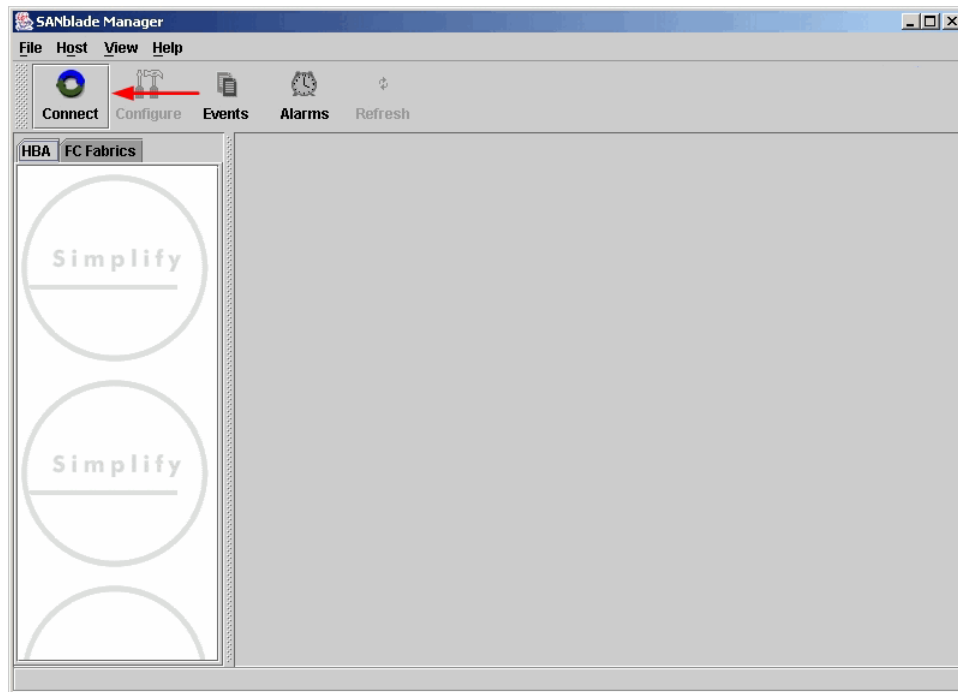
8. Click **Done** when the installation process completes.

Configuring the HBA

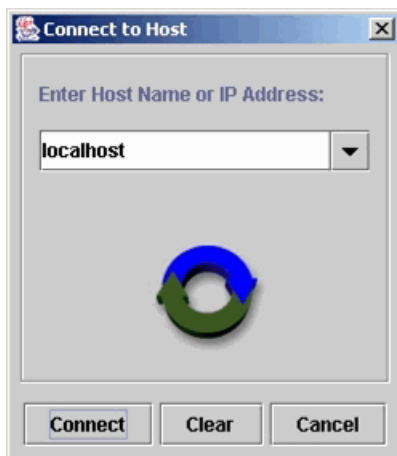
The following section illustrates how to configure the HBA on Windows 2000 Server.

Configuring the HBA on Windows 2000 Server

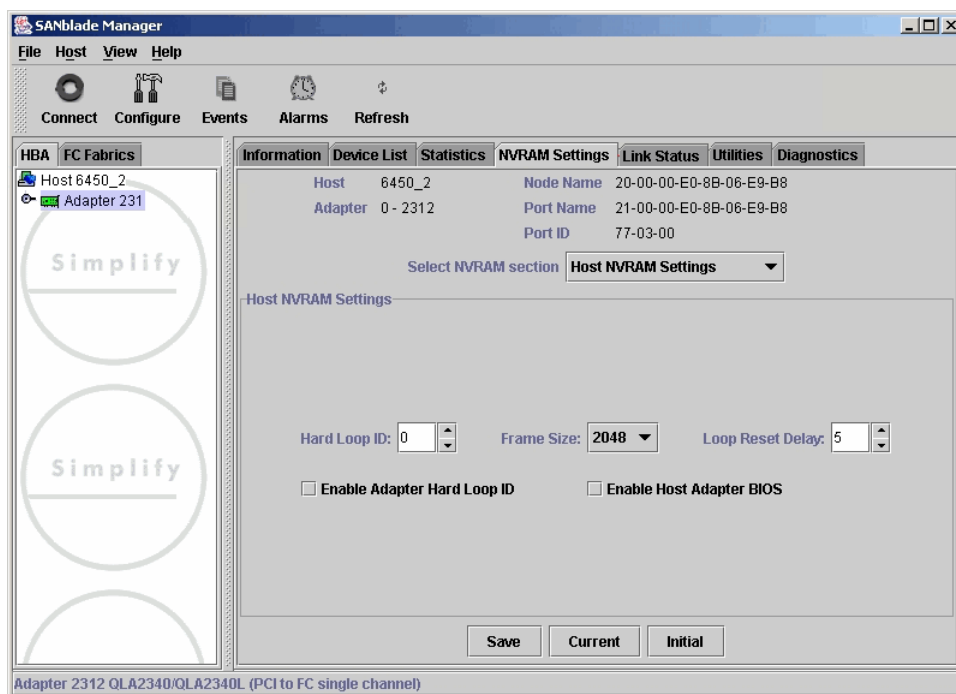
1. Launch SANSurfer.
2. From the SANblade Manager, click **Connect** on the toolbar:



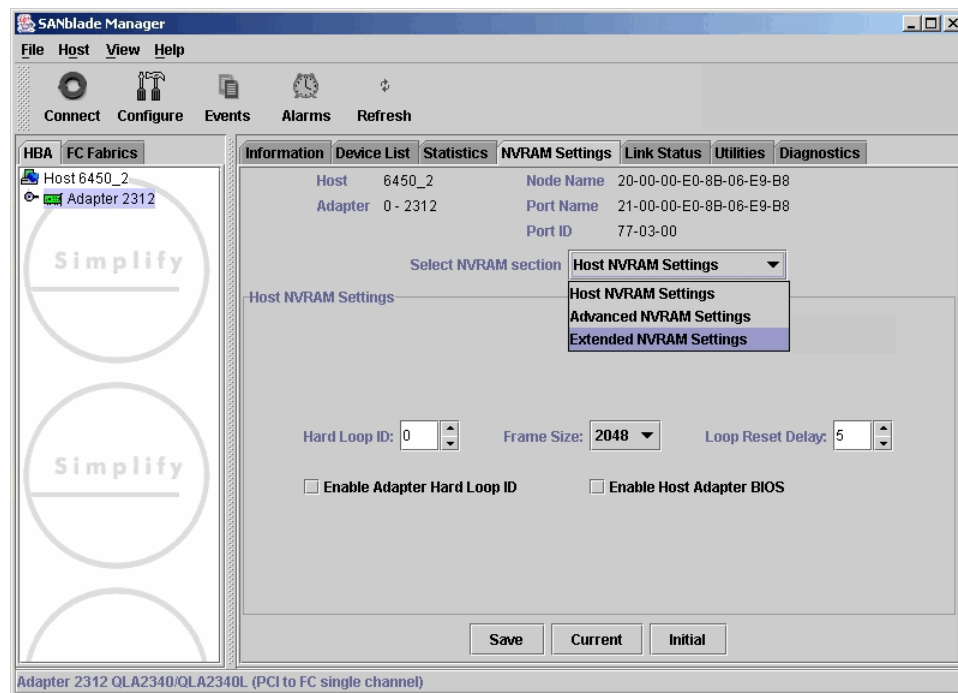
- From the **Connect to Host** dialog, select the host from the list and click **Connect**:



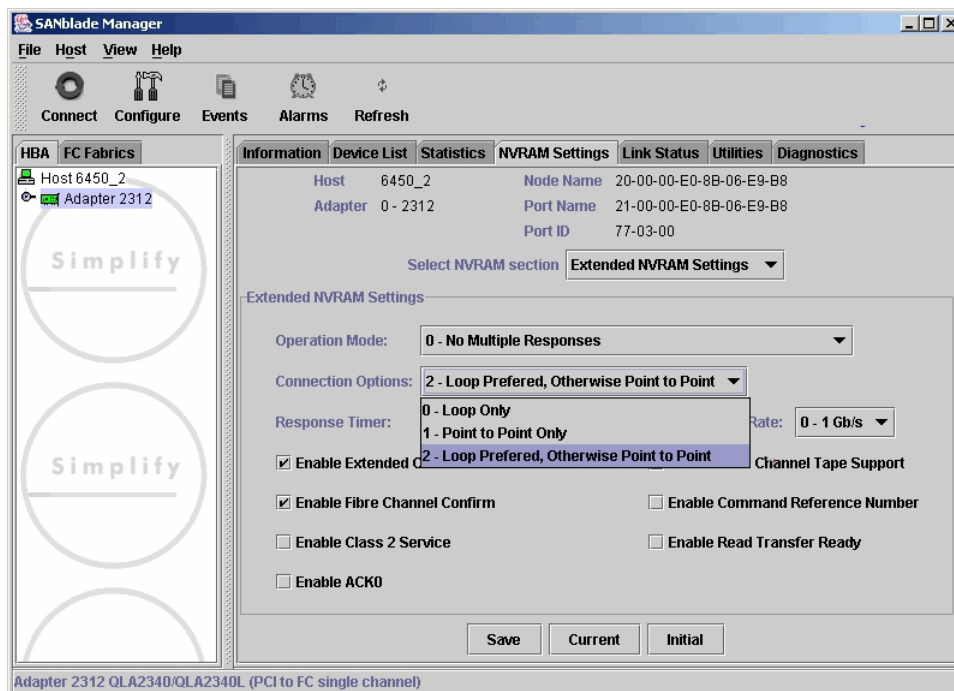
- From the SANblade Manager, select the adapter in the left frame and select the **NVRAM Settings** tab in the right frame:



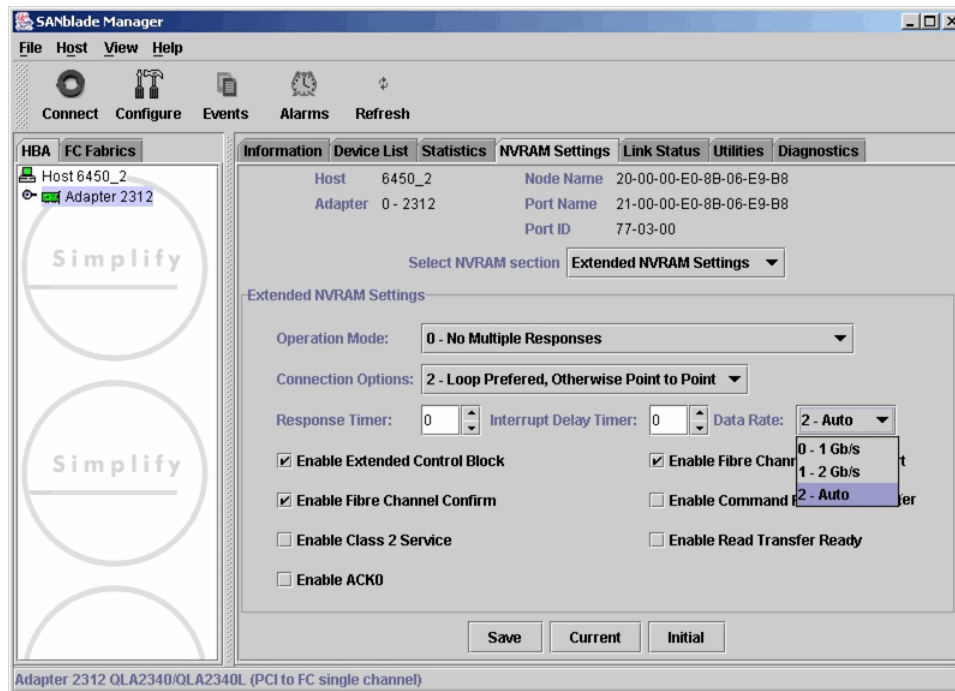
5. Click the **NVRAM Settings** tab and choose **Extended NVRAM Settings** from the **Select NVRAM Section** list:



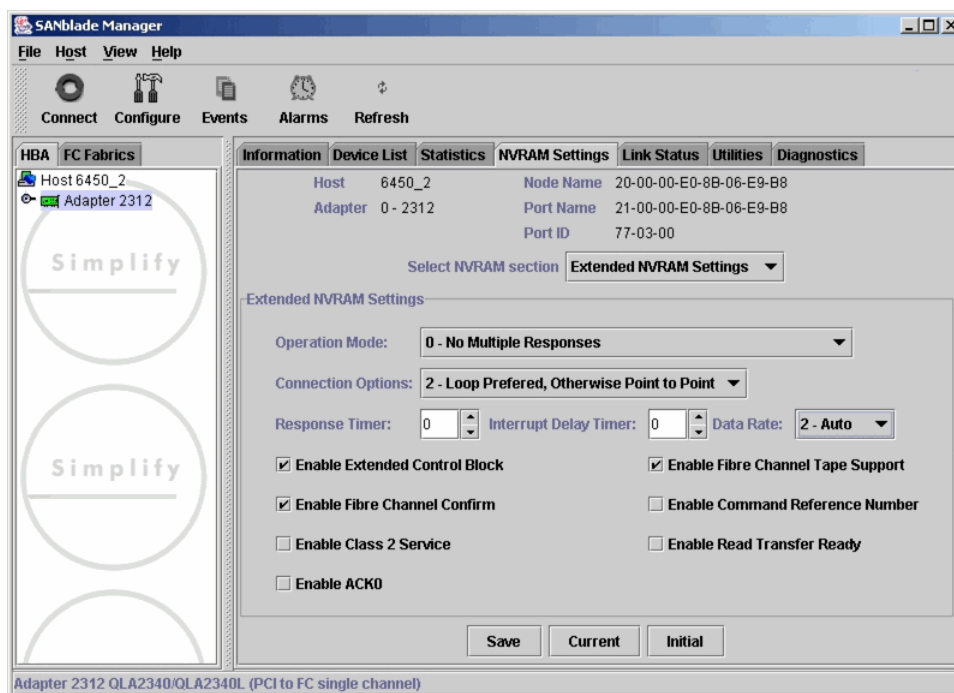
- Select the connection type from the **Connections Options** list:



7. Select the connection speed from the **Data Rate** list:



8. Check **Enable FC Tape Support**:



9. Click **Save**.

10. Enter the **Password** in the Security Check dialog box:



NOTE: The default password is "config". Contact your System Administrator if the password was changed.

11. Click **OK** to close the NVRAM Save confirmation message:



Storage Network Configuration

This section provides instructions to set up and configure the QLogic Fibre Channel switches in the SANbox 5000 Series and SANbox2 Series. Completing the configuration steps in this section prepares the network for host and storage connections.

Fibre Channel Switches from QLogic

Deployed as standalone units or in multi-stage fabrics of any size, QLogic SANbox switches come with all the software tools necessary to create easy-to-manage, resilient and intelligent SANs. For additional information, see http://www.qlogic.com/products/fc_san_switchs.asp.

SANbox 5000 Series Stackable Switches

The SANbox 5200 is the first switch in the new SANbox 5000 Series, providing the benefits of stackable IP switches for your SAN. It delivers the seamless scalability and performance of a chassis switch in an easy-to-manage, pay-as-you-grow solution. With up to sixteen 2Gb ports plus a four-pack of high-speed 10Gb ISL ports, each 5200 stackable switch provides maximum flexibility for configuring, managing and scaling SANs.

SANbox2 Switches

All the SANbox2 switches offer a scalable, highly available solution to protect the investment in your SAN backbone. The next-generation SANbox2 switches bring performance, reliability and simplicity to storage networking. The SANbox2-64 switch is designed to meet the needs of your growing enterprise while the SANbox2-8 and SANbox2-16 switches offer twice the throughput of today's 1 Gb products at a lower cost of entry.

Configuration Overview

The basic steps to configure your SANbox switch are similar, whether you use the SANbox 5000 Series or the SANbox2 Series. Refer to the appropriate section for your switch:

- [SANbox 5000 Series Configuration](#)
- [SANbox2 Configuration](#)

After you have completed the configuration steps for your SANbox switch, the following sections provide guidelines for testing applicable to both the SANbox 5000 and SANbox2 Series switches:

- [Testing Your SAN](#)
 - [Zone Verification](#)
 - [Test Configuration](#)

SANbox 5000 Series Configuration

The following procedures explain how to configure the SANbox 5200 switch, verify the connections and test your configuration:

- [Configuring the Switch](#)
- [Connecting Cables](#)
- [Configuring Zones](#)

NOTE: The SANbox 5200 switch requires a later version of the SANbox Manager than what was available for download with the SANsurfer Management Suite when this guide was published. Be sure to verify the correct version before you configure the switch. Refer to “Application Software” on [page 18](#).

Configuring the Switch

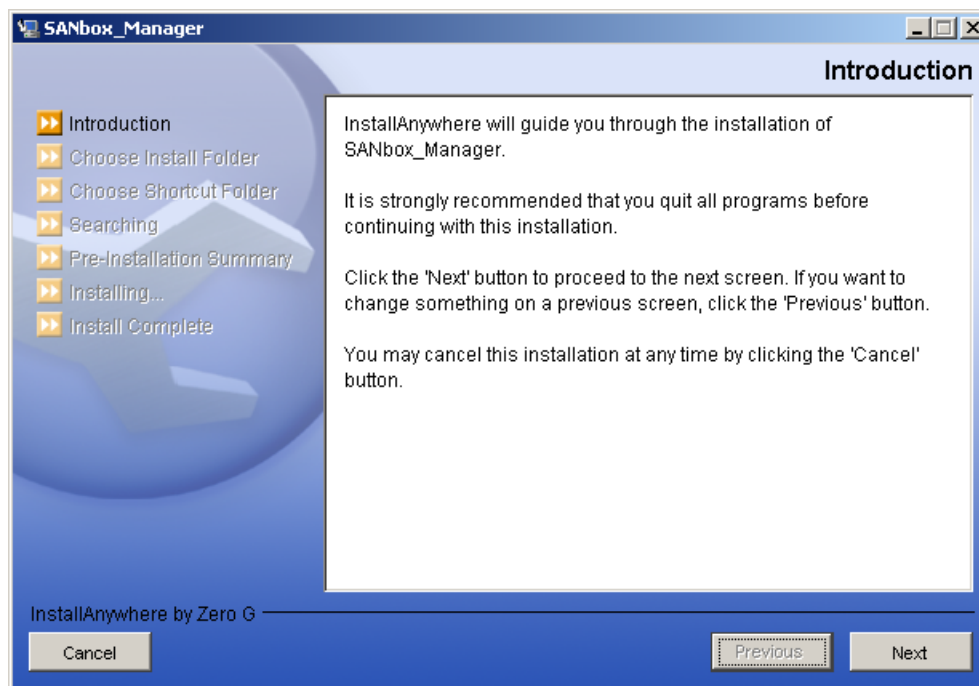
The following procedures explain how to configure the SANbox 5200 switch:

- [Installing SANbox Manager](#)
- [Selecting Configuration Options](#)
- [Configuring Port Properties](#)

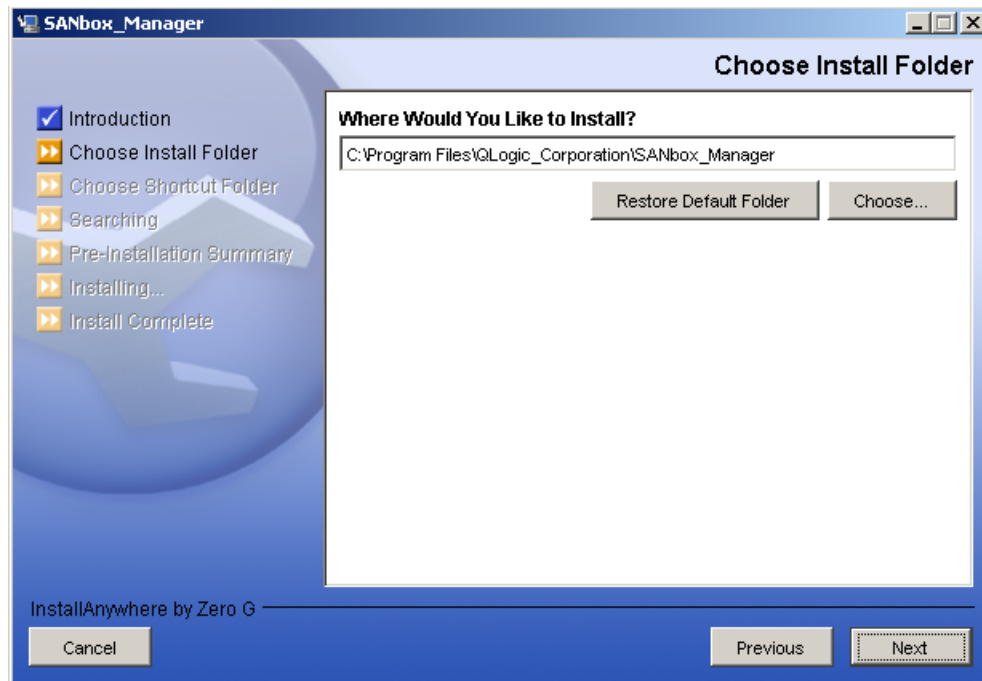
Installing SANbox Manager

NOTE: The following steps explain how to download and install the SANbox Manager separately from the SANsurfer Management Suite.

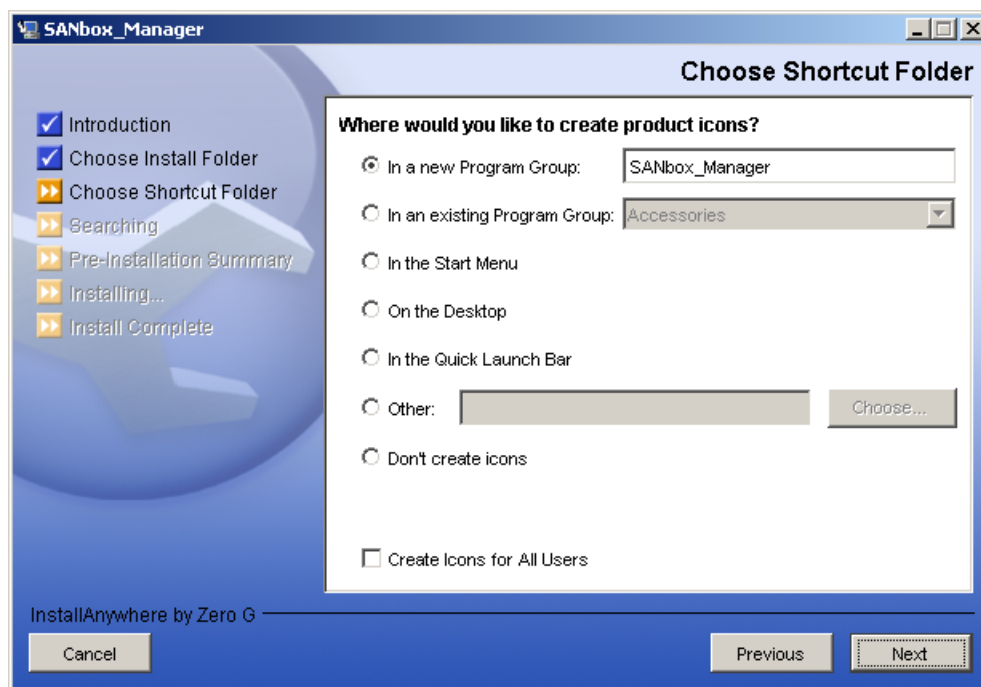
1. Download the SANbox Manager version required for the SANbox 5200 from the Download section of the QLogic website (http://www.qlogic.com/support/drivers_software.asp) and double-click the icon to start the installation.
2. From the Introduction screen, click **Next**:



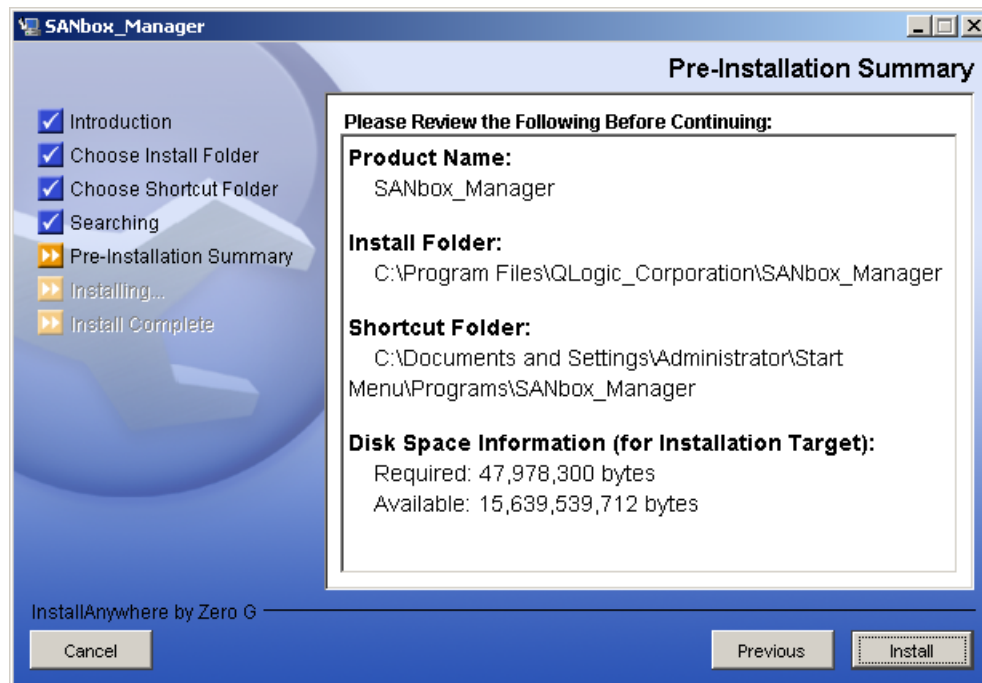
3. From the Choose Install Folder screen:
 - a. Select an installation folder.
 - b. Click **Next**.



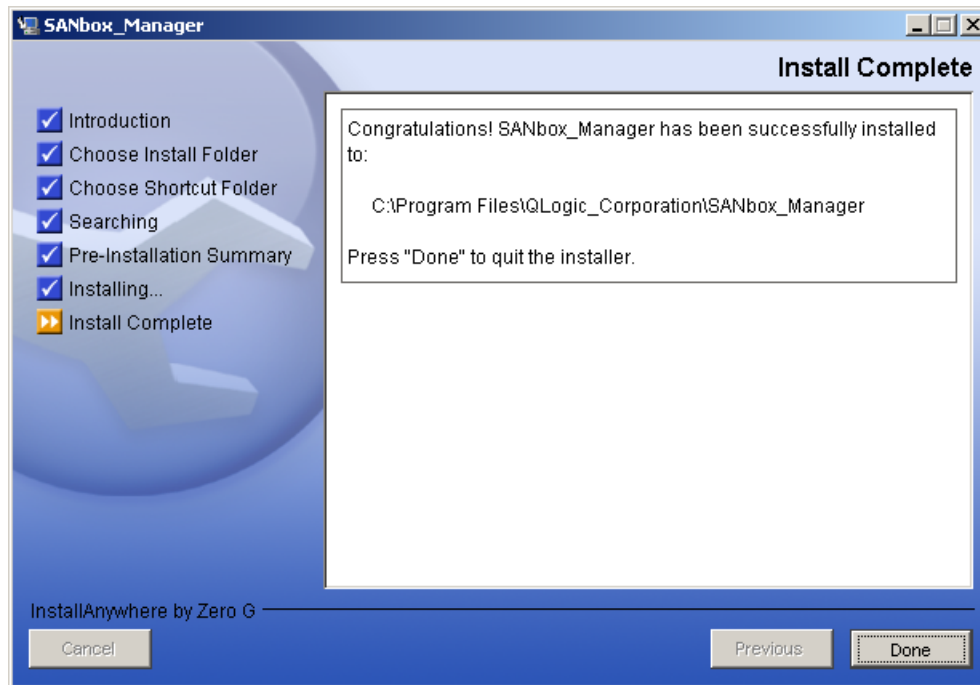
4. From the Choose Shortcut Folder window:
 - a. Select a location for the SANbox Manager shortcut.
 - b. Click **Next**.



5. From the Pre-Installation Summary screen, review the configuration information and click **Install** to start the installation.



6. When you see the Installation Complete message, click **Done** to close the window.

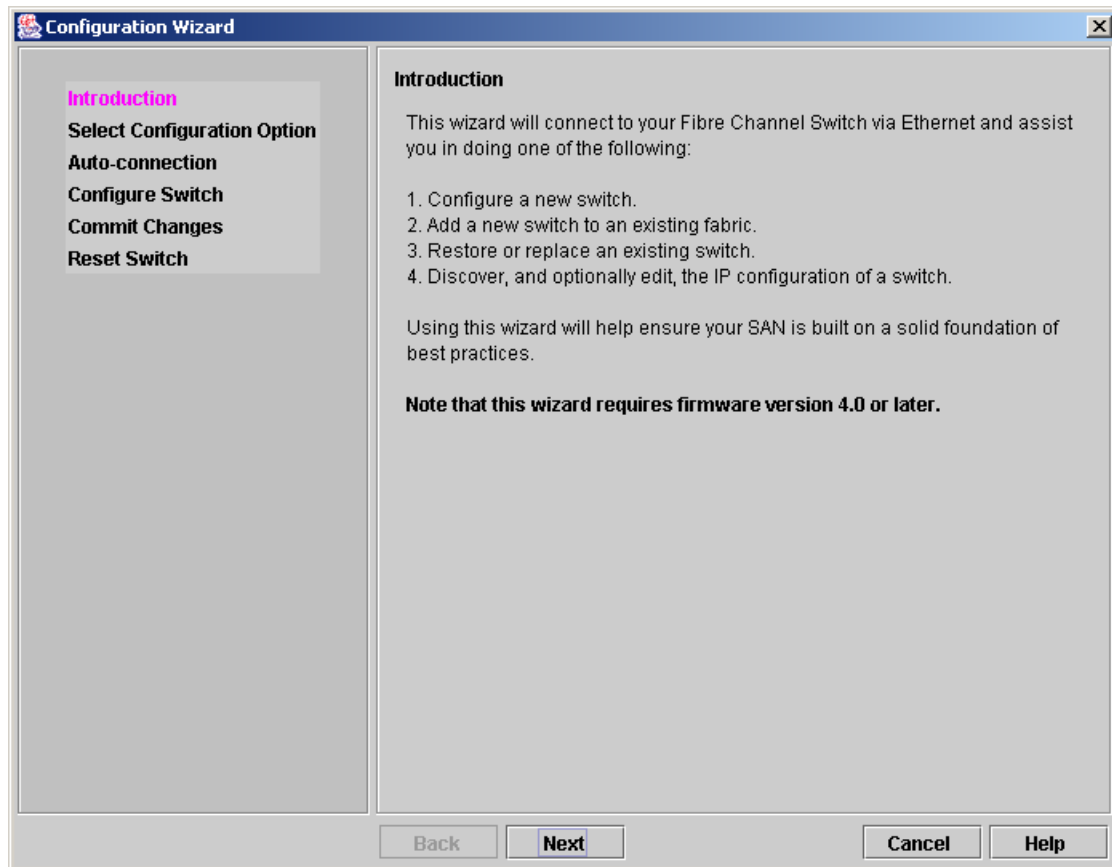


Selecting Configuration Options

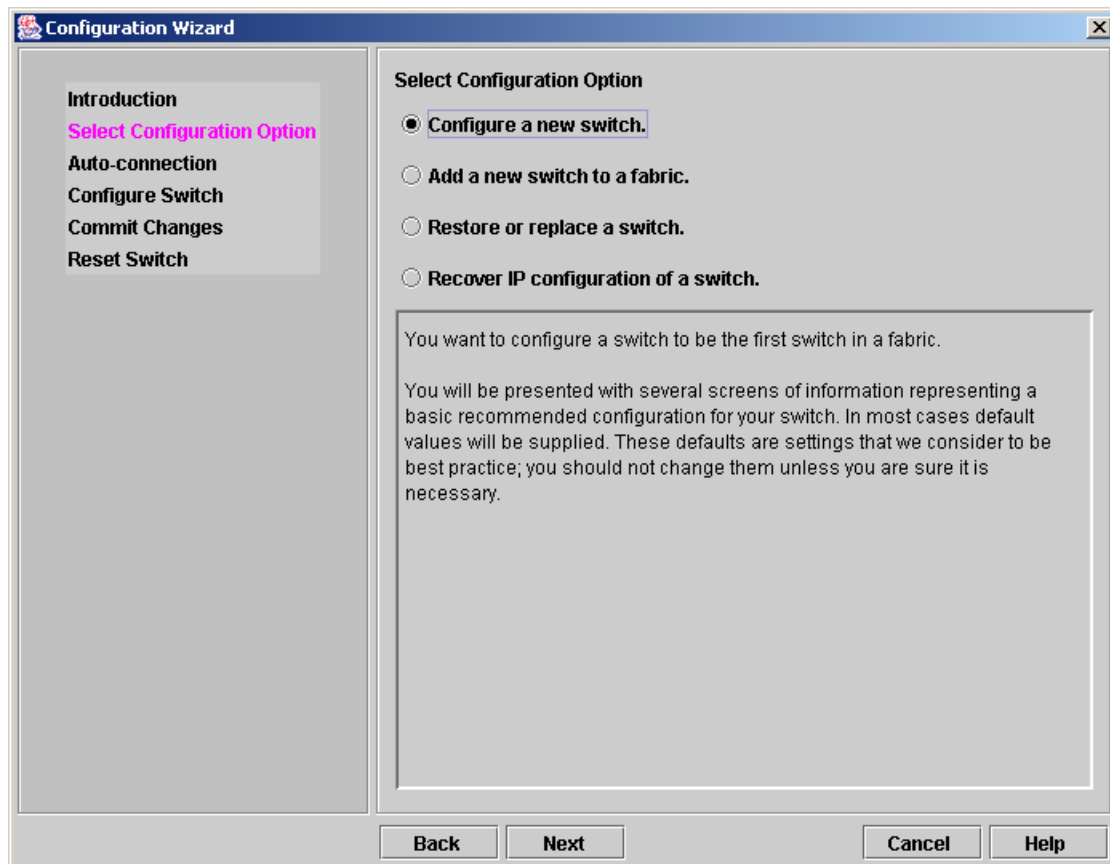
1. Launch SANbox Manager.
2. From the Initial Start Dialog:
 - a. Select **Open Configuration Wizard**.
 - b. Click **Proceed**.



3. From the Introduction window, click **Next**:



4. From the Select Configuration Option window:
 - a. Select **Configure a new switch**.
 - b. Click **Next**.



5. From the Temporary IP Address Assignment window:
 - a. Enter a temporary IP Address and Subnet Mask.
 - b. Click **Next**.

Configuration Wizard

Temporary IP Address Assignment

Connect the switch and this management machine using either an Ethernet crossover cable, switch or hub.

Temporary address assignment uses a broadcast protocol, so the path between this workstation and the Fibre Channel switch to be configured must not include a router or Layer 3 switch.

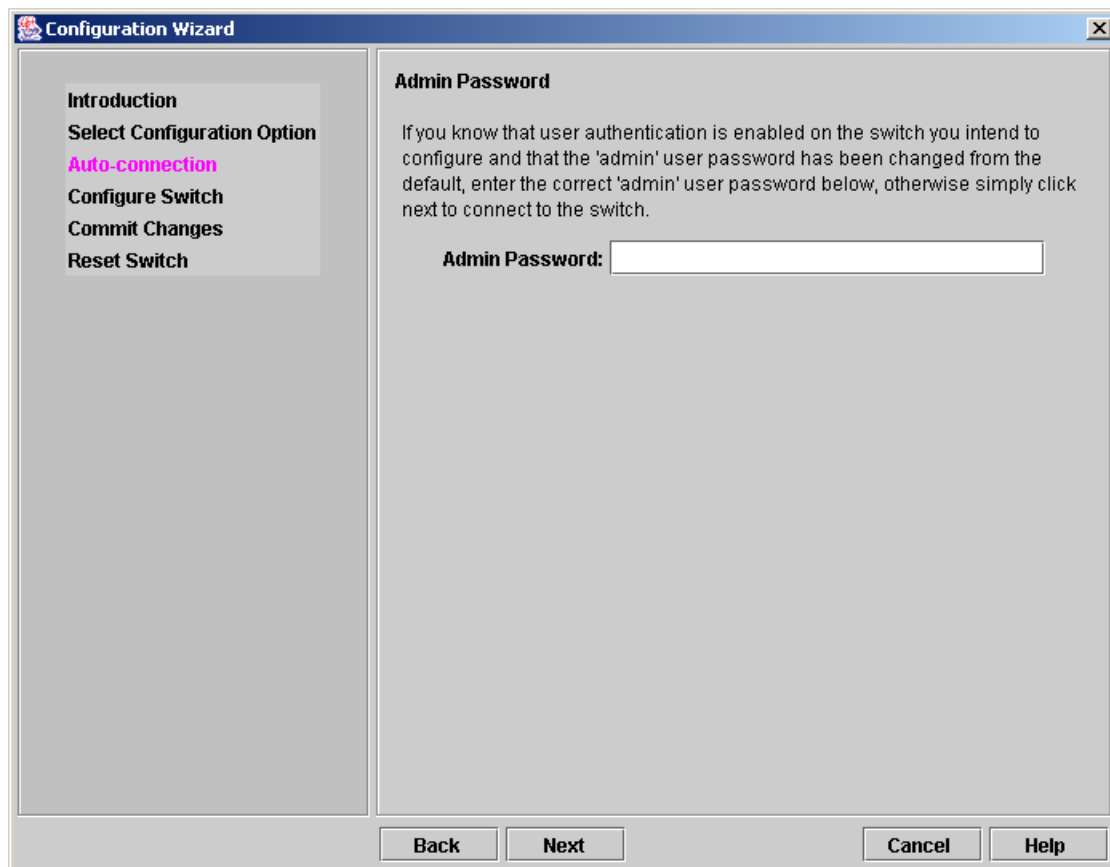
After verifying your physical network connections, enter a temporary IP address to assign to the switch. This will not affect the switch's configured address. The address you choose should be one not already assigned on your network and the Subnet Mask should be the same as the one in use on your workstation. If you are not sure of a safe address to use, consult your network administrator.

IP Address:

Subnet Mask:

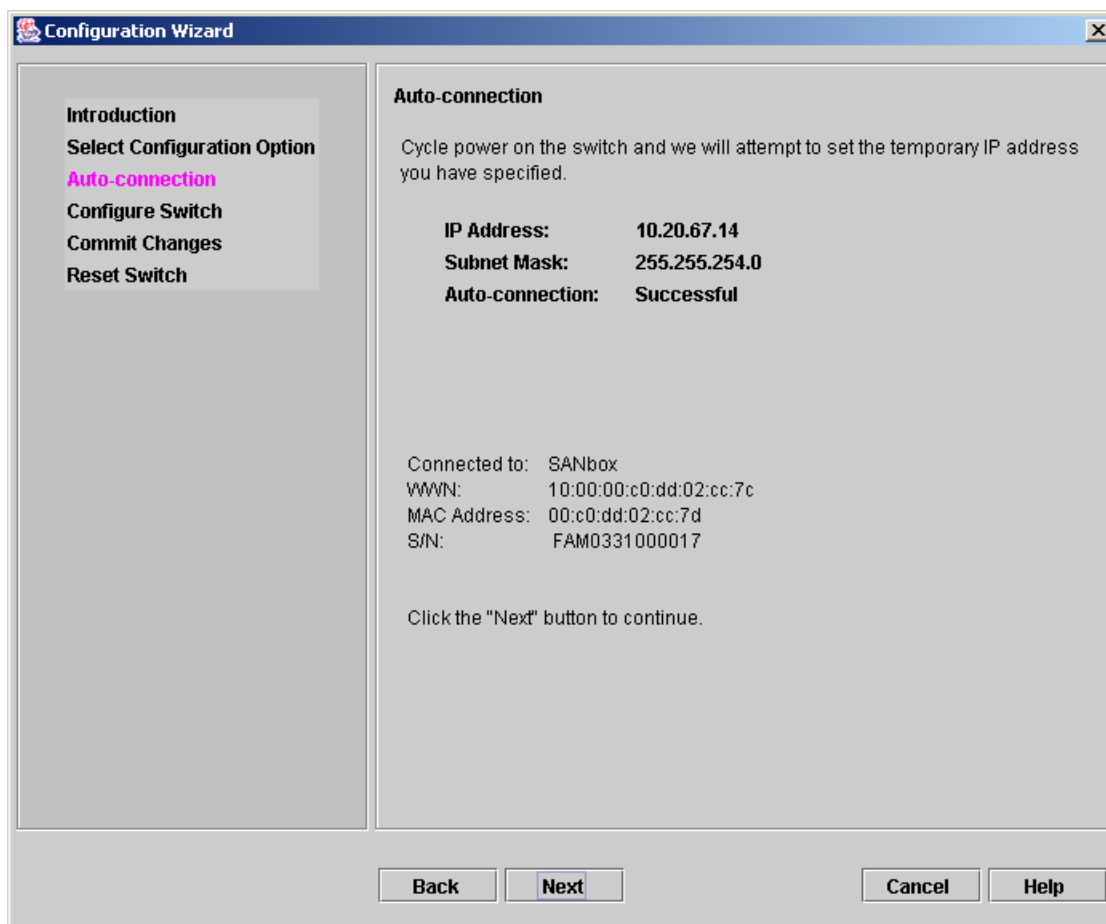
Back **Next** **Cancel** **Help**

- From the Admin Password window, click **Next**.



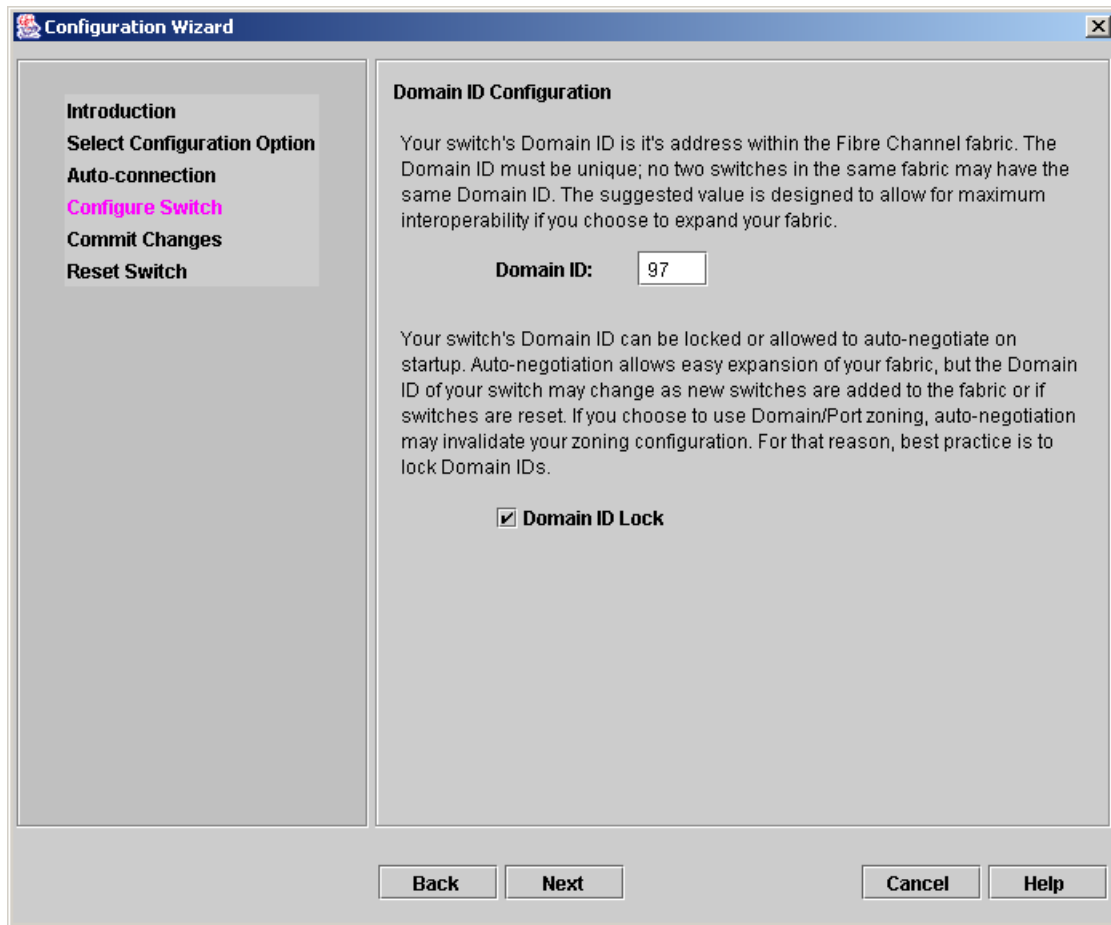
NOTE: User authentication is disabled by default.

7. When the Auto-connection window displays:
 - a. Power on or cycle power on the switch.
 - b. When the new switch information appears in the window, click **Next**.



8. From the Domain ID Configuration window:
 - a. Select the desired **Domain ID** (optional if Domain ID Lock disabled).
 - b. Check **Domain ID Lock** if you want to hard set your Domain ID.

c. Click **Next**.



The image shows a screenshot of the 'Configuration Wizard' window, specifically the 'Domain ID Configuration' step. The window has a title bar with the text 'Configuration Wizard' and a close button. On the left side, there is a vertical list of navigation options: 'Introduction', 'Select Configuration Option', 'Auto-connection', 'Configure Switch' (highlighted in pink), 'Commit Changes', and 'Reset Switch'. The main area of the window is titled 'Domain ID Configuration'. It contains a paragraph explaining that the switch's Domain ID is its address within the Fibre Channel fabric, must be unique, and that the suggested value is designed for maximum interoperability. Below this text, there is a label 'Domain ID:' followed by a text box containing the value '97'. Another paragraph explains that the Domain ID can be locked or allowed to auto-negotiate on startup, and that locking it is best practice. At the bottom of this section, there is a checkbox labeled 'Domain ID Lock' which is checked. At the very bottom of the window, there are four buttons: 'Back', 'Next', 'Cancel', and 'Help'.

Configuration Wizard

Domain ID Configuration

Your switch's Domain ID is its address within the Fibre Channel fabric. The Domain ID must be unique; no two switches in the same fabric may have the same Domain ID. The suggested value is designed to allow for maximum interoperability if you choose to expand your fabric.

Domain ID:

Your switch's Domain ID can be locked or allowed to auto-negotiate on startup. Auto-negotiation allows easy expansion of your fabric, but the Domain ID of your switch may change as new switches are added to the fabric or if switches are reset. If you choose to use Domain/Port zoning, auto-negotiation may invalidate your zoning configuration. For that reason, best practice is to lock Domain IDs.

☒ **Domain ID Lock**

Back **Next** **Cancel** **Help**

9. In the Switch Symbolic Name window:
 - a. Enter a name for the switch.
 - b. Click **Next**.

The screenshot shows a 'Configuration Wizard' window. On the left is a sidebar with a list of steps: 'Introduction', 'Select Configuration Option', 'Auto-connection', 'Configure Switch' (highlighted in pink), 'Commit Changes', and 'Reset Switch'. The main area is titled 'Switch Symbolic Name'. It contains explanatory text about the importance of a unique switch name and a naming convention. Below the text is a text input field labeled 'Switch Symbolic Name:' with the value 'FCSwitch_97' entered. At the bottom of the window are four buttons: 'Back', 'Next' (highlighted with a blue border), 'Cancel', and 'Help'.

Configuration Wizard

Switch Symbolic Name

A unique switch name is important. In a multi-switch fabric, the reasons for this are clear. However, even if this is your only Fibre Channel switch, a unique switch name reduces confusion if you ever need to provide logs or other information for technical support.

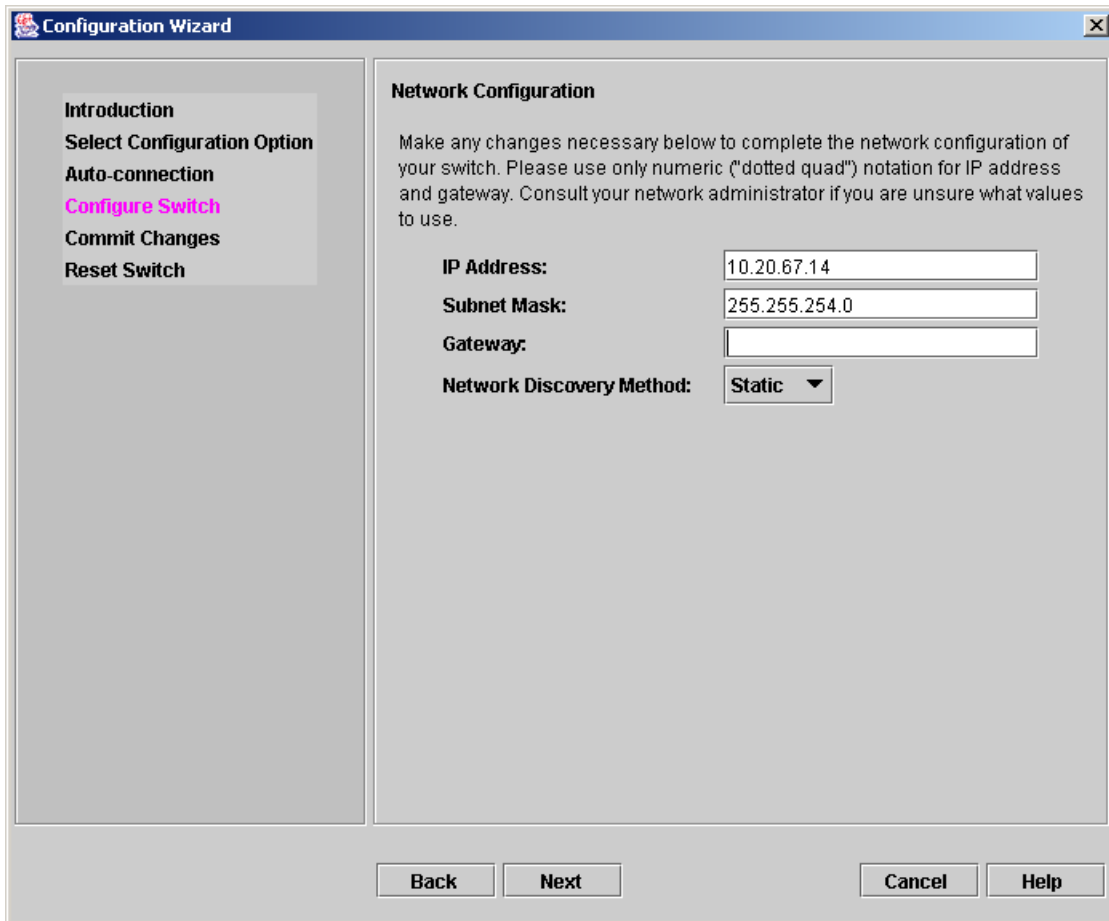
A common naming convention is to start with a short descriptive name and append either the switch's Domain ID or the last octet of it's IP address.

The switch name may be between 1 and 32 characters long and must not contain any of the following characters: ,#

Switch Symbolic Name:

Back **Next** **Cancel** **Help**

10. From the Network Configuration window:
 - a. Enter the desired IP Address and other network information.
 - b. Click **Next**.



The image shows a screenshot of the 'Configuration Wizard' window, specifically the 'Network Configuration' step. The window has a title bar with a close button. On the left is a sidebar with a list of steps: 'Introduction', 'Select Configuration Option', 'Auto-connection', 'Configure Switch' (highlighted in pink), 'Commit Changes', and 'Reset Switch'. The main area is titled 'Network Configuration' and contains a paragraph of instructions: 'Make any changes necessary below to complete the network configuration of your switch. Please use only numeric ("dotted quad") notation for IP address and gateway. Consult your network administrator if you are unsure what values to use.' Below this text are four input fields: 'IP Address' with the value '10.20.67.14', 'Subnet Mask' with the value '255.255.254.0', 'Gateway' which is empty, and 'Network Discovery Method' which is a dropdown menu set to 'Static'. At the bottom of the window are four buttons: 'Back', 'Next', 'Cancel', and 'Help'.

Configuration Wizard

Network Configuration

Make any changes necessary below to complete the network configuration of your switch. Please use only numeric ("dotted quad") notation for IP address and gateway. Consult your network administrator if you are unsure what values to use.

IP Address: 10.20.67.14

Subnet Mask: 255.255.254.0

Gateway:

Network Discovery Method: Static

Back Next Cancel Help

11. From the Switch Date and Time window:
 - a. Check **Use date/time from this workstation** or manually enter the date and time for the switch if you are not using the local system information.
 - b. Click **Next**.

Configuration Wizard

Switch Date and Time

Setting the date and time on your switch is vital in order to have useful log entries and alarms. You may either allow us to set the switch date and time to match the time on this workstation, or enter a specific date and time to be set on the switch.

☒ **Use date/time from this workstation.**

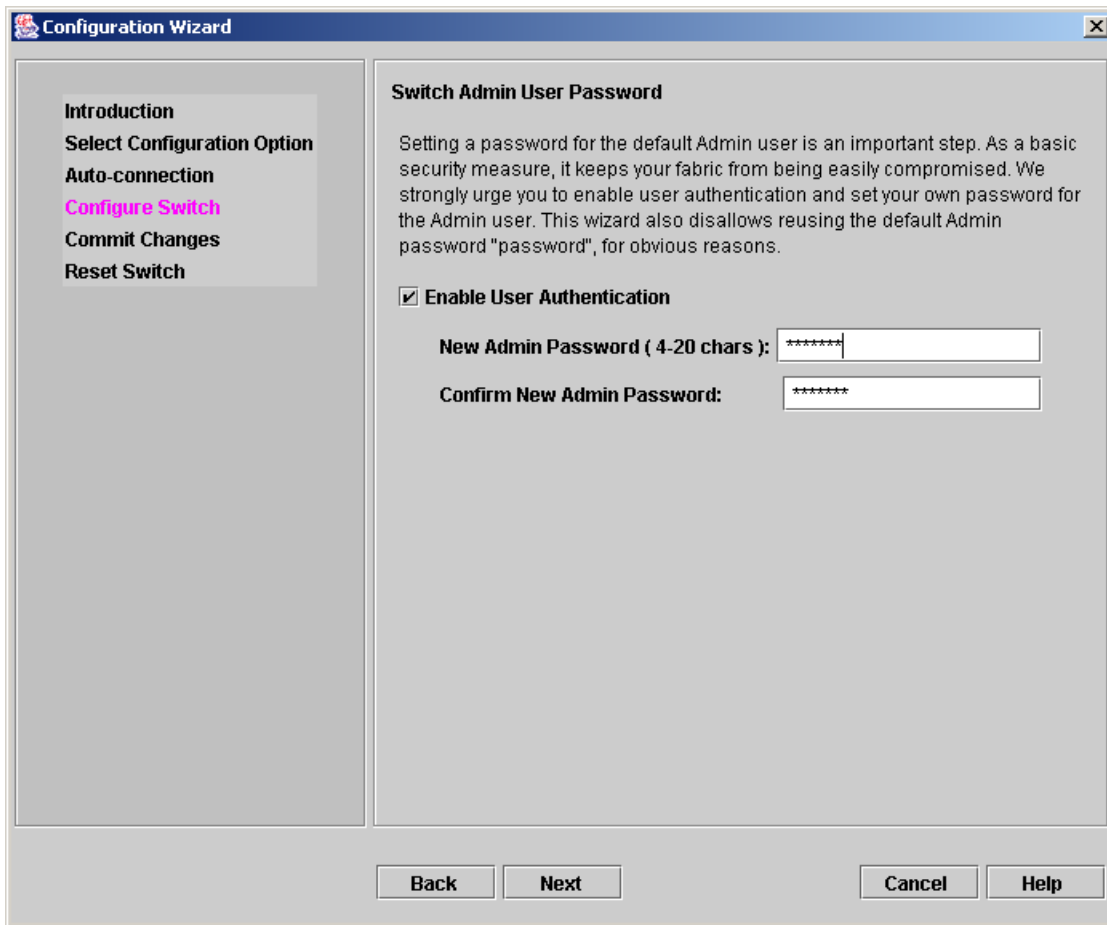
Month: November
Day: 9
Year: 2003

Hour: 11
Minutes: 48
☒ AM ☐ PM

Back Next Cancel Help

12. From the Switch Admin User Password window:
 - a. Check **Enable user authentication** if you want to use this option. Otherwise, leave unchecked.
 - b. Enter and confirm a **New Admin Password** if you are enabling user authentication. Otherwise, leave these fields blank.

- c. Click **Next**.



The image shows a screenshot of the 'Configuration Wizard' window, specifically the 'Switch Admin User Password' step. The window has a title bar with 'Configuration Wizard' and a close button. On the left is a sidebar with a list of steps: 'Introduction', 'Select Configuration Option', 'Auto-connection', 'Configure Switch' (highlighted in pink), 'Commit Changes', and 'Reset Switch'. The main area contains the title 'Switch Admin User Password' and a paragraph explaining the importance of setting a password for the default Admin user. Below this is a checkbox labeled 'Enable User Authentication' which is checked. There are two password input fields: 'New Admin Password (4-20 chars):' and 'Confirm New Admin Password:', both containing masked characters (asterisks). At the bottom are four buttons: 'Back', 'Next', 'Cancel', and 'Help'.

Configuration Wizard

Switch Admin User Password

Setting a password for the default Admin user is an important step. As a basic security measure, it keeps your fabric from being easily compromised. We strongly urge you to enable user authentication and set your own password for the Admin user. This wizard also disallows reusing the default Admin password "password", for obvious reasons.

☒ **Enable User Authentication**

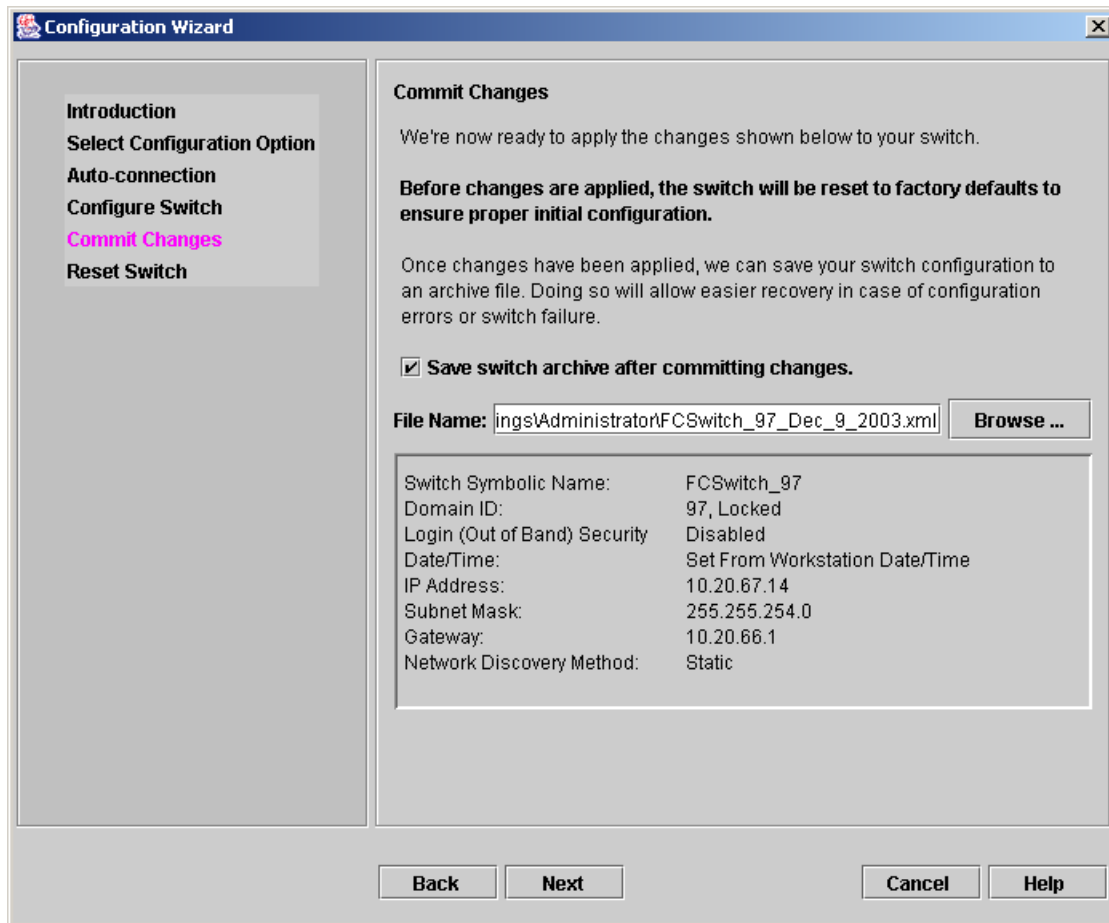
New Admin Password (4-20 chars):

Confirm New Admin Password:

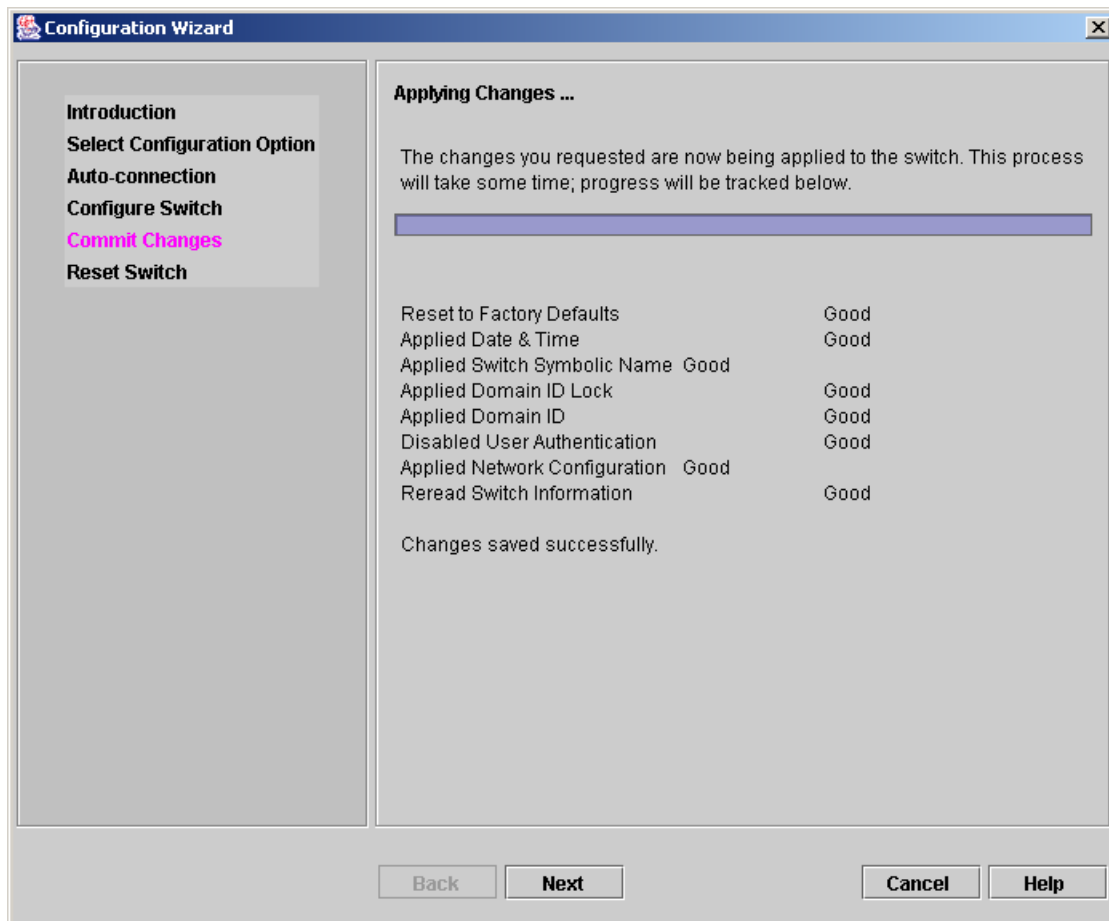
Back **Next** **Cancel** **Help**

13. From the Commit Changes window:
- Review the configuration settings.
 - Check **Save switch archive after committing changes** if you want to save the switch configuration archive file; then select the location and file name.

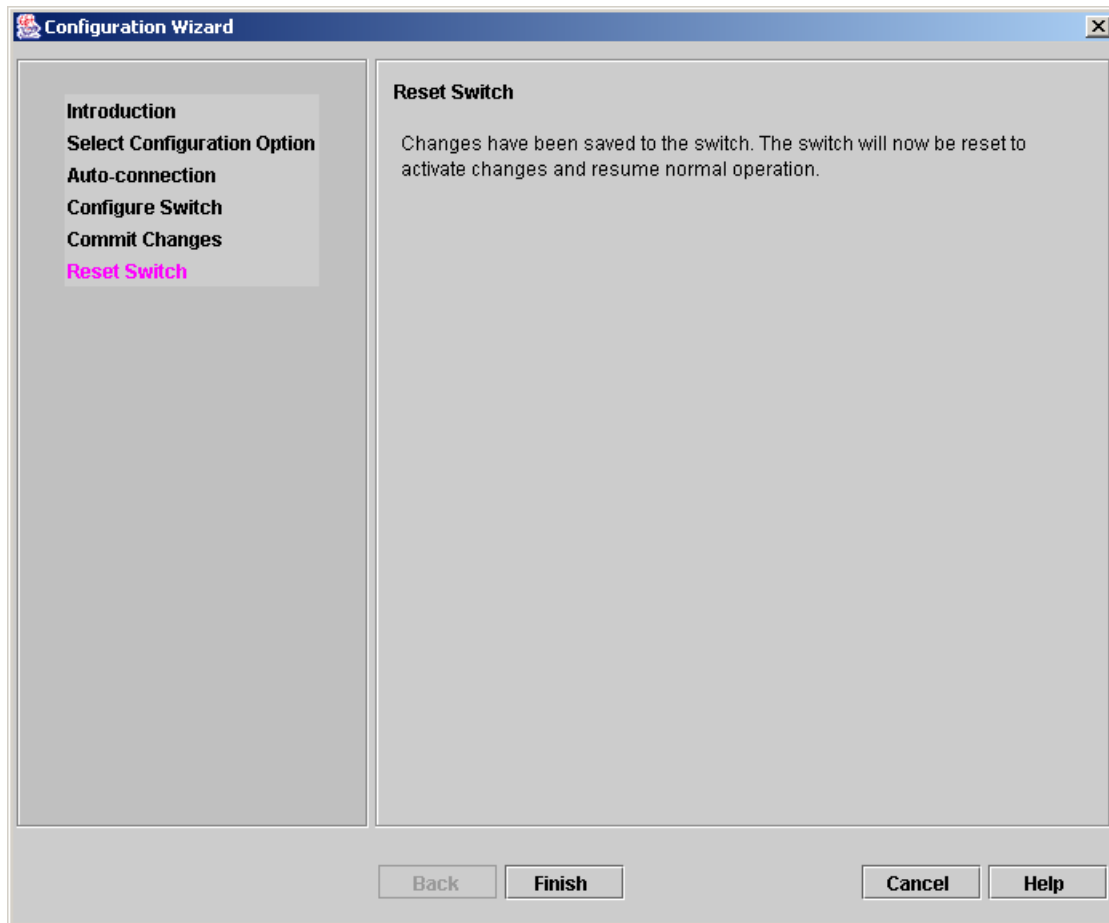
c. Click **Next**.



14. From the Apply Changes window:
 - a. Verify that all changes were applied.
 - b. Click **Next**.



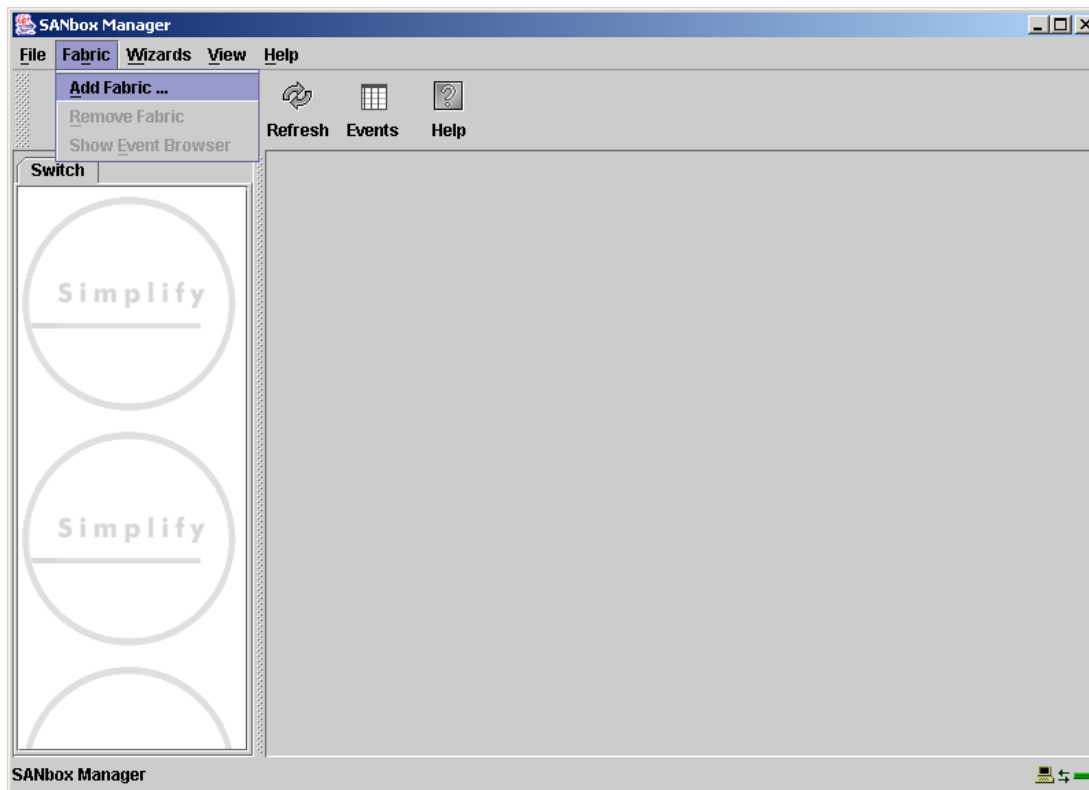
15. From the Reset Switch window, click **Finish** to complete the configuration.



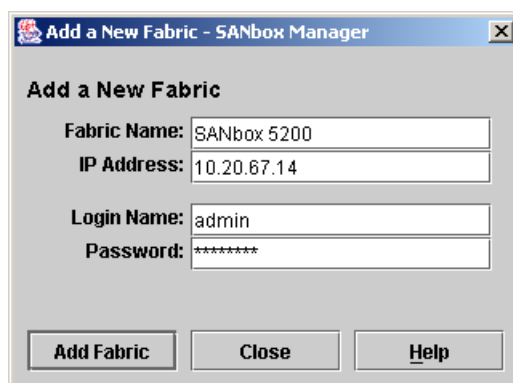
16. From the Finished window, click **Close**.

Configuring Port Properties

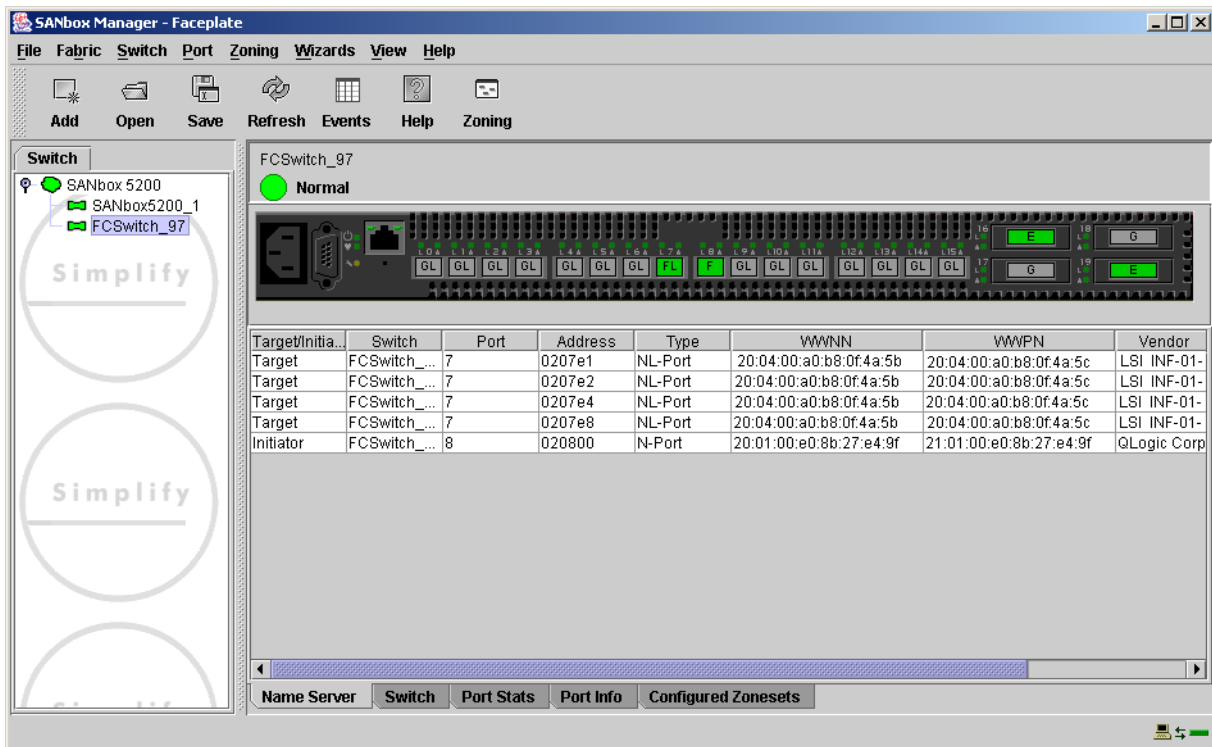
1. From the SANbox Manager, select **Add Fabric** from the Fabric menu:



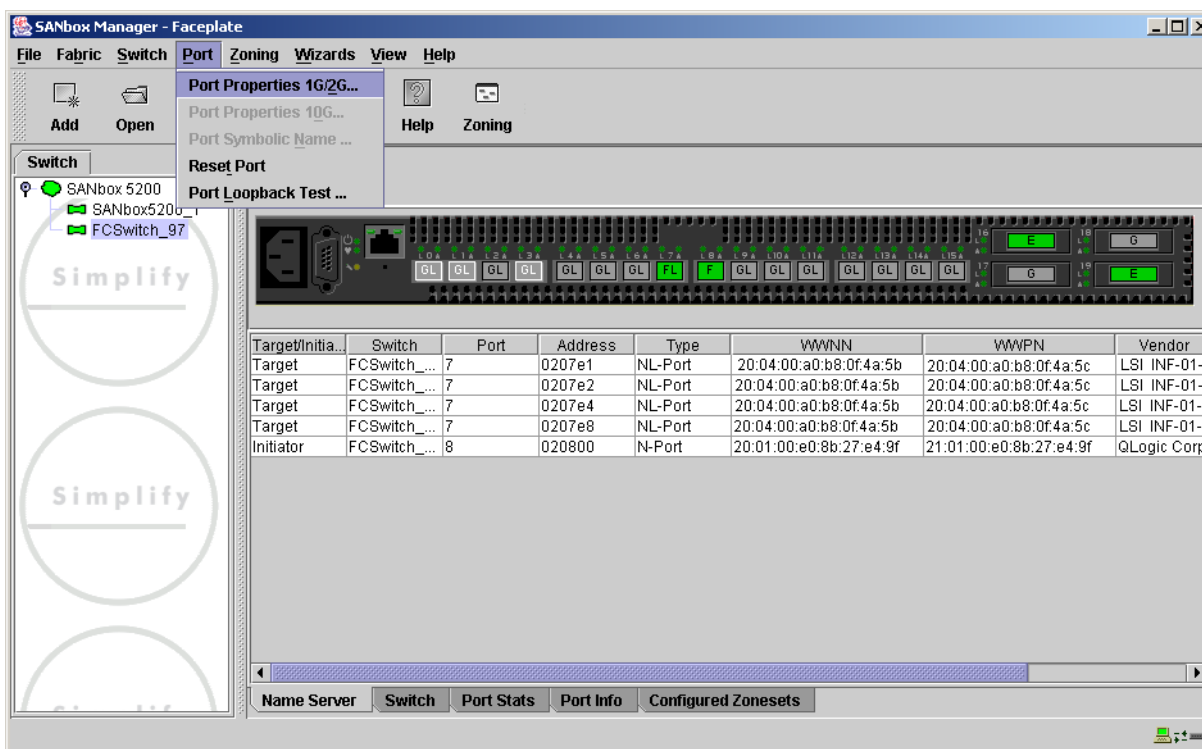
2. From the Add a New Fabric dialog:
 - a. Enter a **Fabric Name**, **IP Address**, and **Login Name/Password** (if user authentication enabled).
 - b. Click **Add Fabric**.



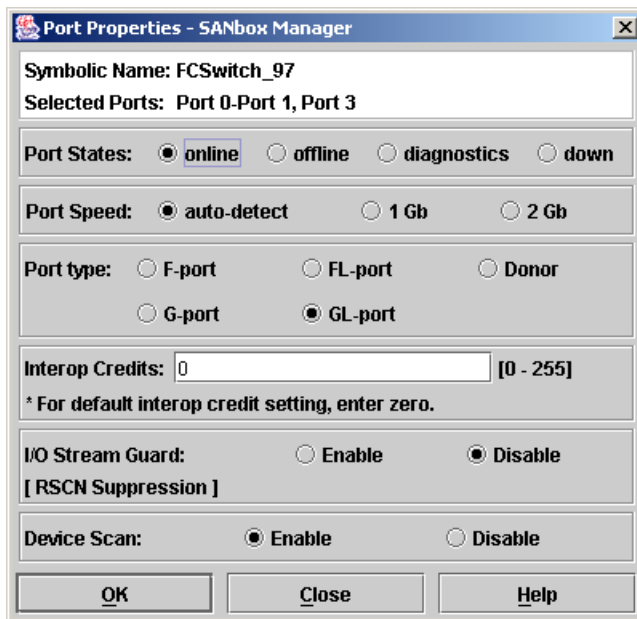
- From the SANbox Manager – Faceplate dialog, expand the fabric and select the switch you wish to configure:



4. From the SANbox Manager – Faceplate dialog:
 - a. Select one or more 1G/2G ports from the list.
 - b. Select **Port Properties 1G/2G** from the Port menu.



5. From the Port Properties dialog:
 - a. Select the desired port settings.
 - b. Click **OK**.



Port Properties - SANbox Manager

Symbolic Name: FCSwitch_97
Selected Ports: Port 0-Port 1, Port 3

Port States: ☒ online ☐ offline ☐ diagnostics ☐ down

Port Speed: ☒ auto-detect ☐ 1 Gb ☐ 2 Gb

Port type: ☐ F-port ☐ FL-port ☐ Donor
☐ G-port ☒ GL-port

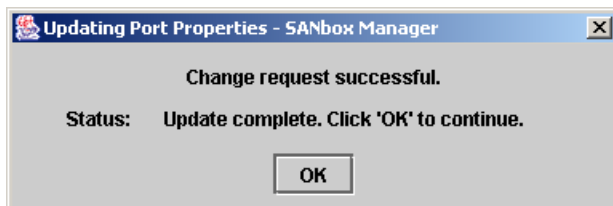
Interop Credits: [0 - 255]
 * For default interop credit setting, enter zero.

I/O Stream Guard: ☐ Enable ☒ Disable
 [RSCN Suppression]

Device Scan: ☒ Enable ☐ Disable

OK **Close** **Help**

6. Click **OK** to close the Updating Port Properties message:



Updating Port Properties - SANbox Manager

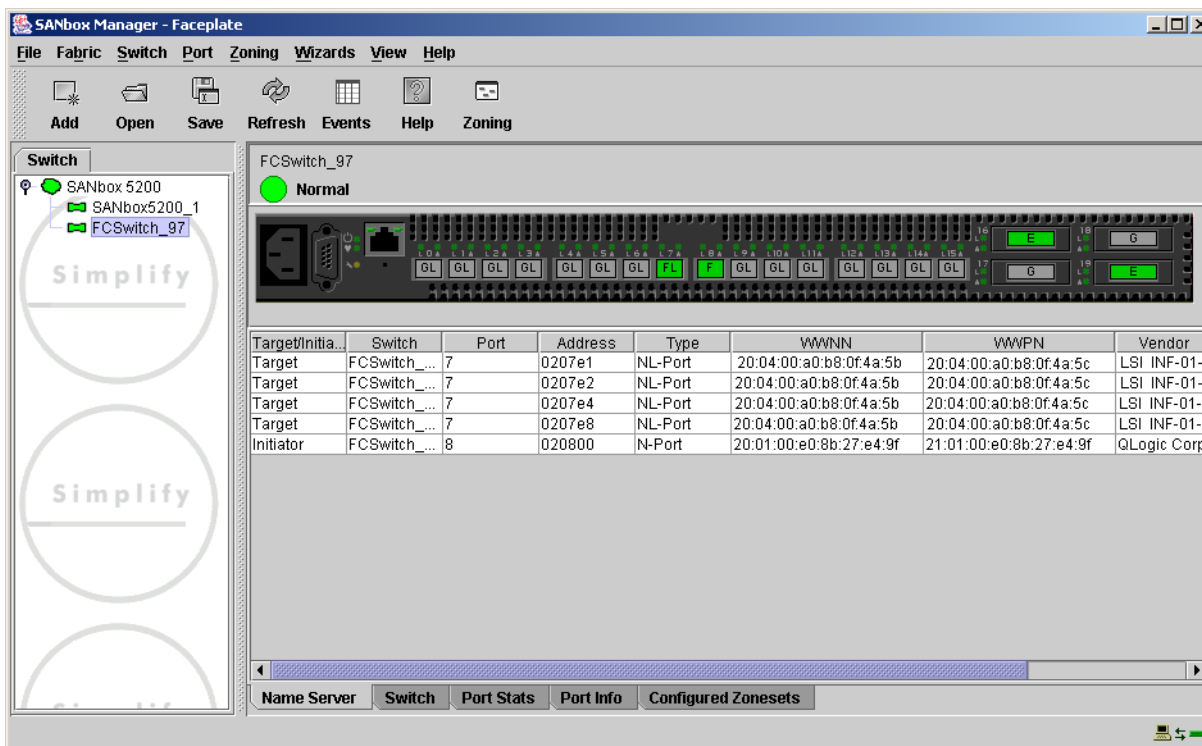
Change request successful.

Status: Update complete. Click 'OK' to continue.

OK

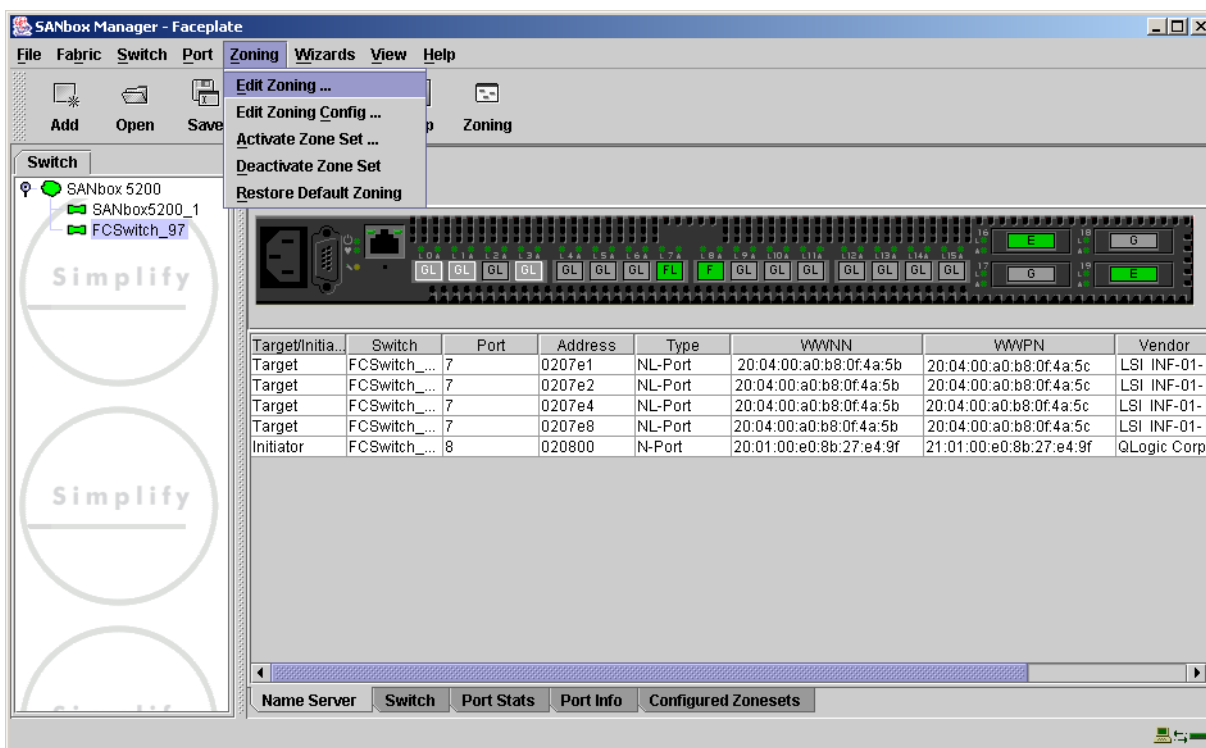
Connecting Cables

1. Connect the devices to the SANbox 5200 switch ports you configured.
2. Verify that the green Login LED is illuminated for each device.
3. Launch SANbox Manager and connect to the SANbox 5200.
4. From the SANbox Manager – Faceplate dialog, verify that all devices are listed in the Name Server.

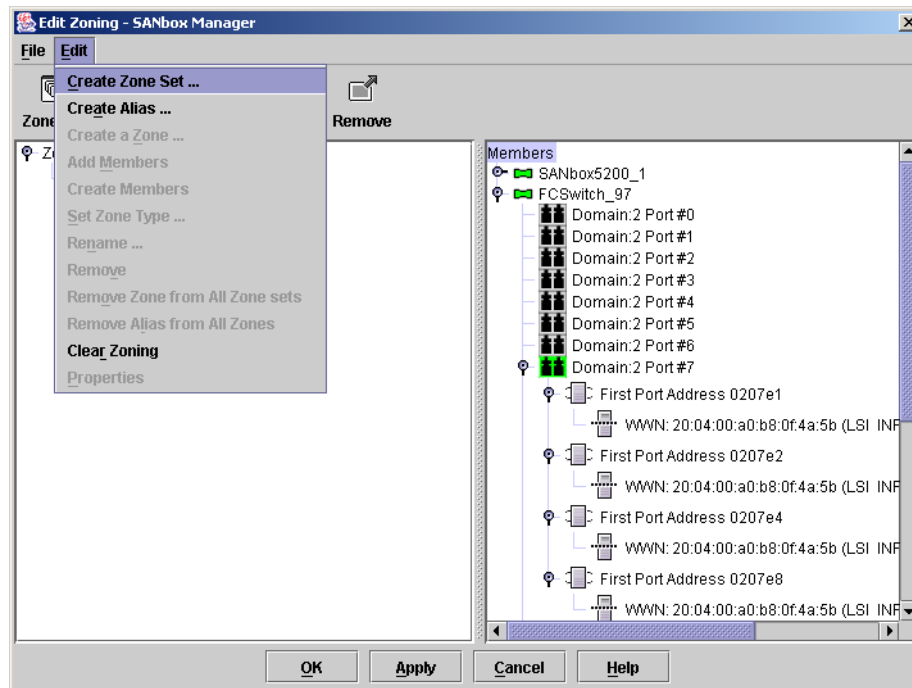


Configuring Zones

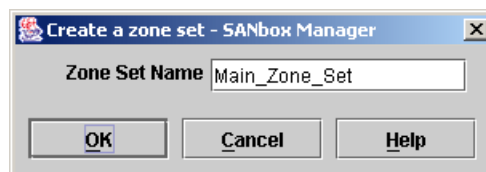
1. Launch the SANbox Manager and connect to the SANbox 5200.
2. From the SANbox Manager – Faceplate dialog, select **Edit Zoning** from the Zoning menu:



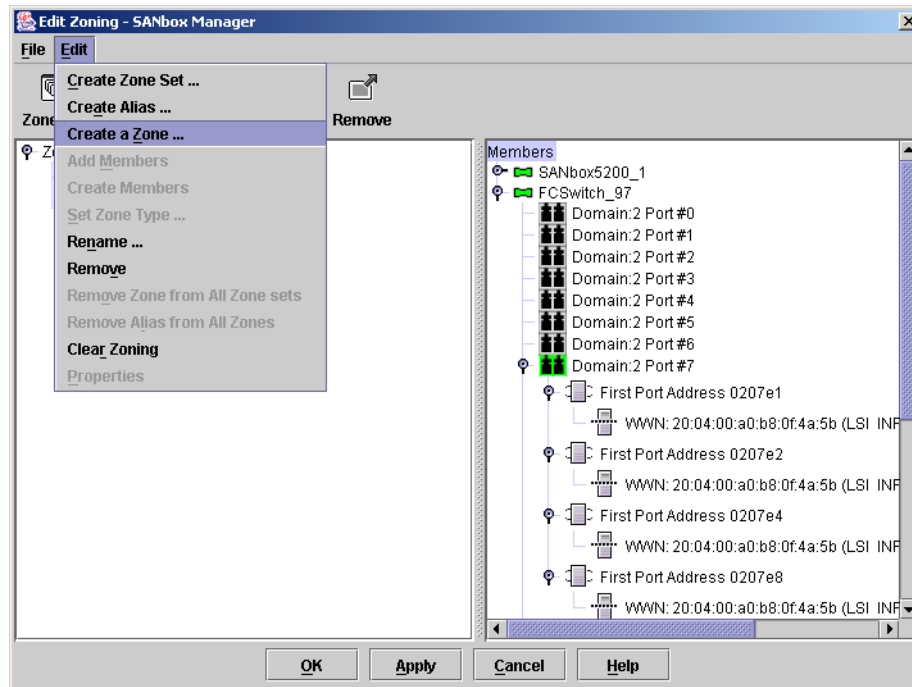
3. From the Edit Zoning dialog, select **Create Zone Set** from the Edit menu:



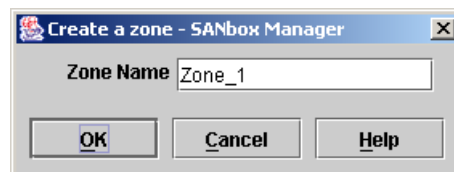
4. From the Create a zone set dialog:
 - a. Enter a **Zone Set Name**.
 - b. Click **OK**.



5. From the Edit Zoning dialog:
 - a. Select the new zone set in the left frame.
 - b. Select **Create a Zone** from the Edit menu.

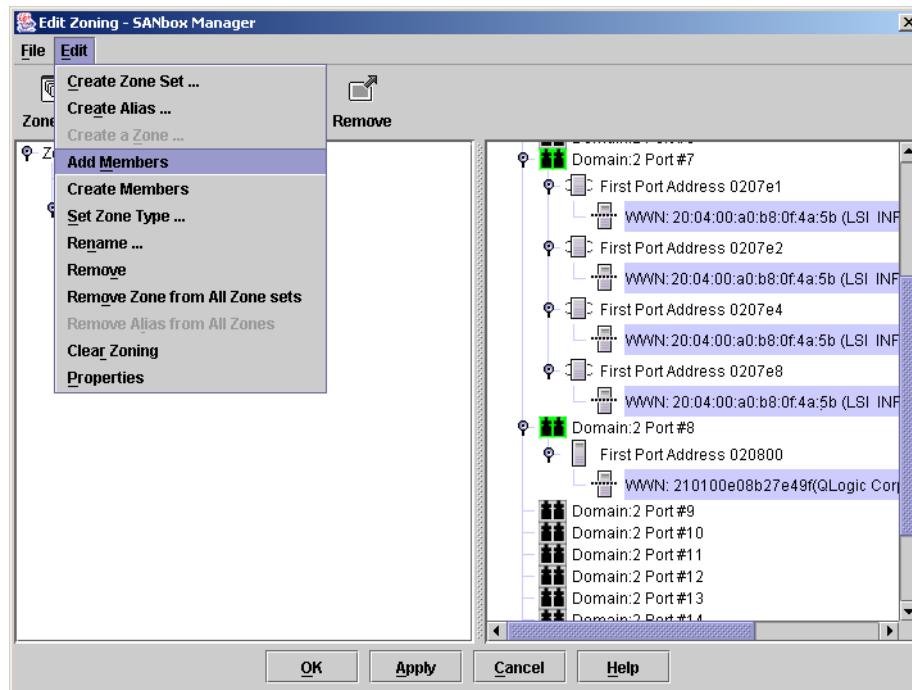


6. From the Create a zone dialog:
 - a. Enter a **Zone Name**.
 - b. Click **OK**.

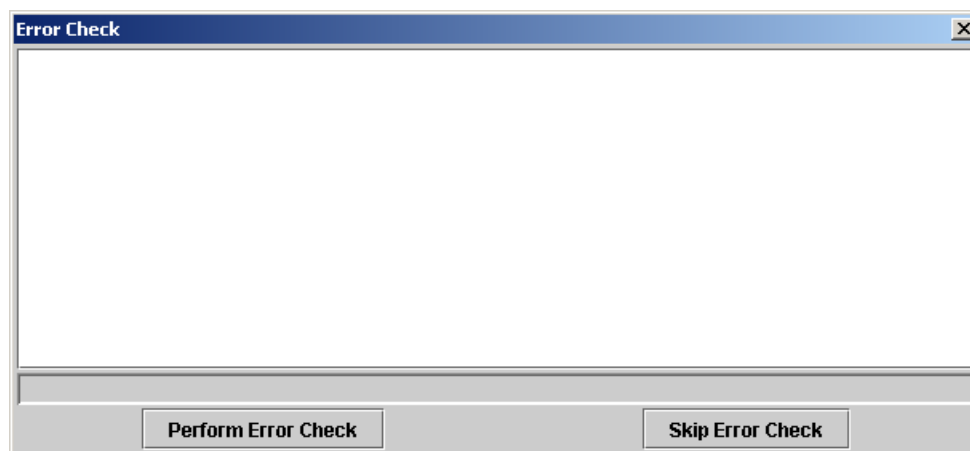


7. From the Edit Zoning dialog:
 - a. Expand the zone set and select the zone in the left frame.
 - b. Highlight the devices to add in the right frame.
 - c. Select **Add Members** from the Edit menu.

- d. Click **OK**.



8. From the Error Check dialog:
- a. Click **Perform Error Check**.



- b. Verify that there were no errors reported:

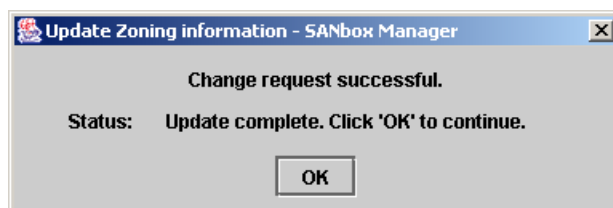


- c. Click **Proceed with Save**.

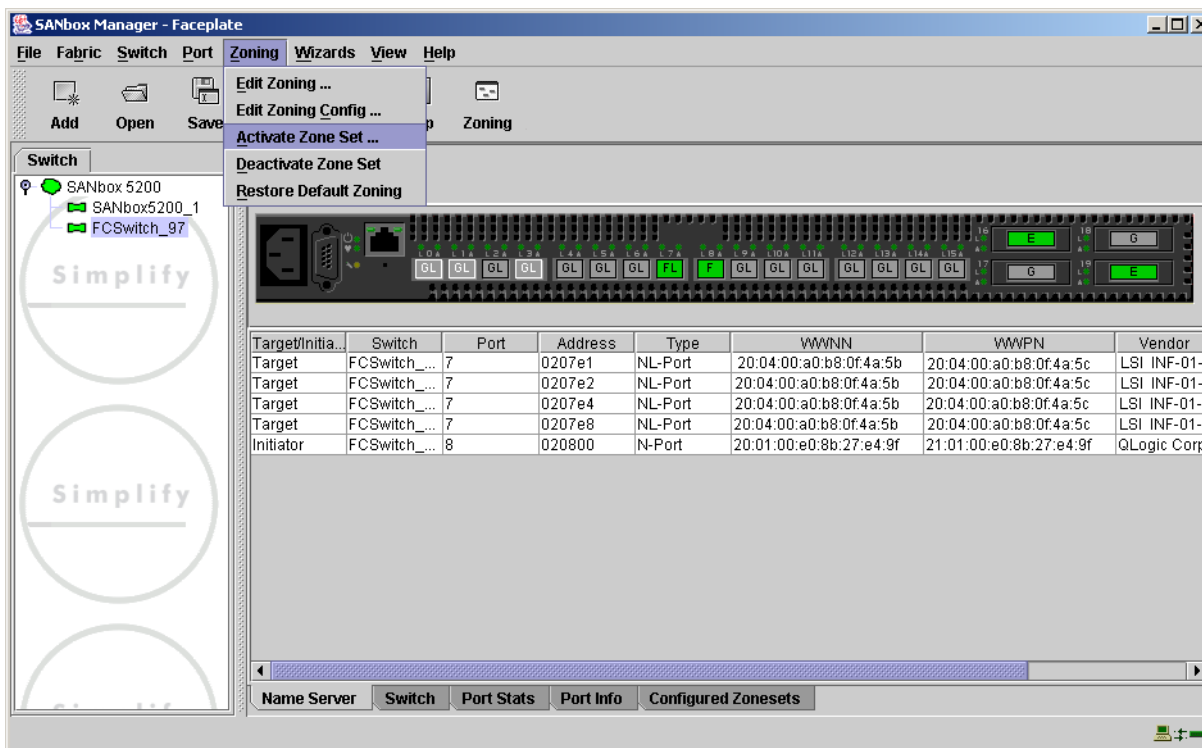
9. Click **OK** to close the Zoning data confirmation message:



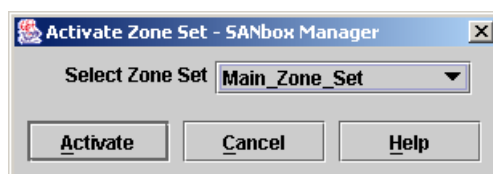
10. Click **OK** to close the Update Zoning information message:



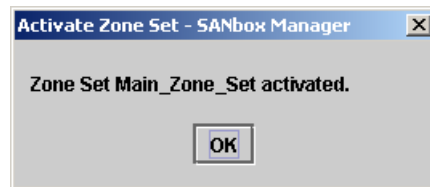
11. From the SANbox Manager – Faceplate dialog, select **Activate Zone Set** from the Zoning menu:



12. From the Activate Zone Set dialog:
 - a. Select the Zone Set to activate from the list.
 - b. Click **Activate**.



13. Click **OK** to close the Activate Zone Set confirmation message:



SANbox2 Configuration

The following procedures explain how to configure the SANbox2 switch, verify the connections and test your configuration:

- [Configuring the Switch](#)
- [Connecting Cables](#)
- [Configuring Zones](#)

The SANbox2-64 was tested in both standalone and cascade environments.

If your SAN configuration uses a multi-vendor environment, see the *QLogic Switch Interoperability Guide* located at <http://www.qlogic.com/interopguide> for configuration procedures.

Configuring the Switch

The following procedures explain how to configure the SANbox2 switch:

- [Configuring Serial Ports](#)
- [Assigning IP Address](#)
- [Configuring Port Properties](#)
- [Setting up HBA Persistent Binding](#)

Configuring Serial Ports

1. Connect a DB9 (female) Null modem cable to the switch.
2. Launch a serial communication application and configure it with the following settings:
 - ☐ **BAUD Rate:** 9600
 - ☐ **Data Bits:** 8
 - ☐ **Parity:** None
 - ☐ **Stop Bits:** 1
 - ☐ **Flow Control:** None

Assigning IP Address

Using the Command Line Interface (CLI):

1. Login to the switch. (username: **admin**, Password: **password**)
2. Start the administrator mode:

```
SANbox2 #> admin start
```

3. Start the switch setup program to configure the IP address.

```
SANbox2 (Admin) #> set setup system
Eth0NetworkAddress      (dot-notated IP Address)      [10. 0.0.1] <IP Address>
Eth0NetworkMask          (dot-notated IP Address)      [255.0.0.0] <Net Mask>
```

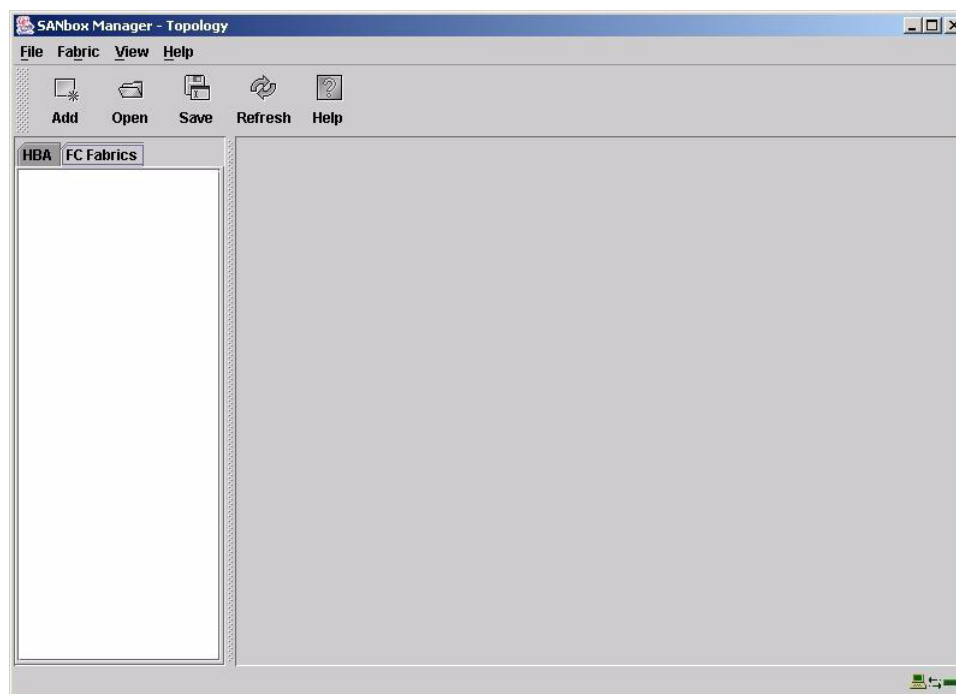
Eth0GatewayAddress	(dot-notated IP Address)	[10.0.0.1] <Gateway>
Eth0NetworkDiscovery	(1=Static, 2=Bootp, 3=Dhcp, 4=Rarp)	[Static]
AdminTimeout	(dec value 0-1440 minutes, 0=never)	[30]
TempMonitoringWarning	(dec value 0-100 degrees Celsius)	[65]
TempMonitoringFailure	(dec value 0-100 degrees Celsius)	[70]
TempFailurePortShutdown	(True / False)	[False]
SecurityEnabled	(True / False)	[False]
LocalLogEnabled	(True / False)	[True]
RemoteLogEnabled	(True / False)	[False]
RemoteLogHostAddress	(dot-notated IP Address)	[10.0.0.254]

Do you want to save and activate this system setup? (y/n): [n] y

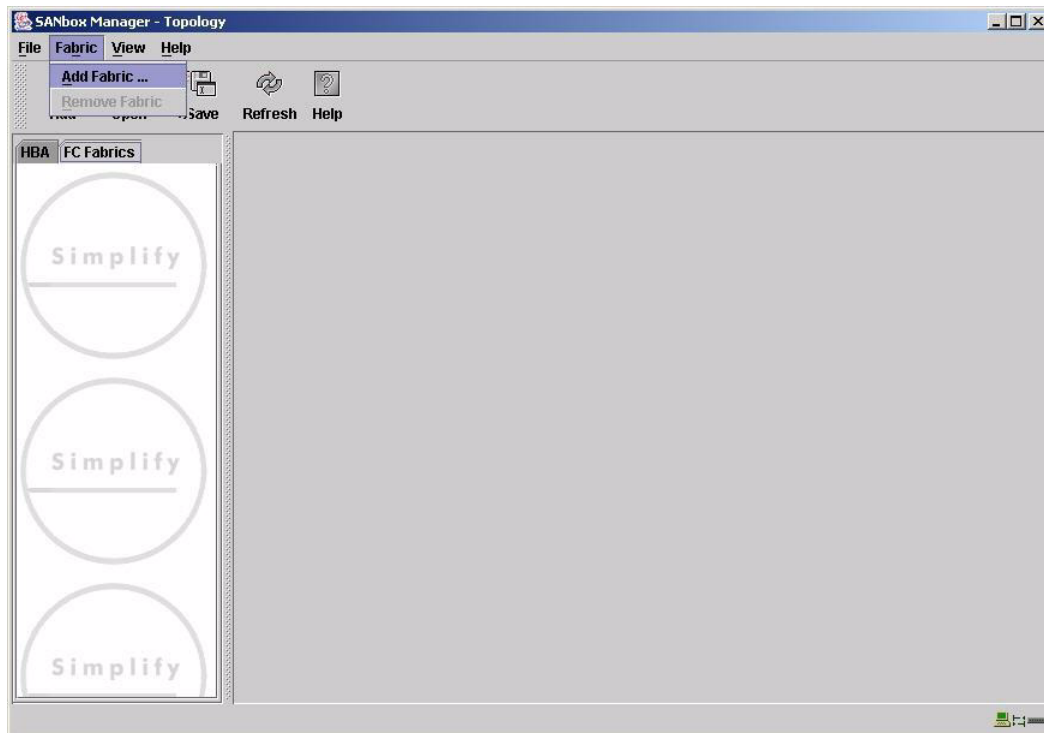
System setup saved and activated.

Configuring Port Properties

1. Launch SANbox Manager.
2. From the main window, click the **FC Fabric** tab:



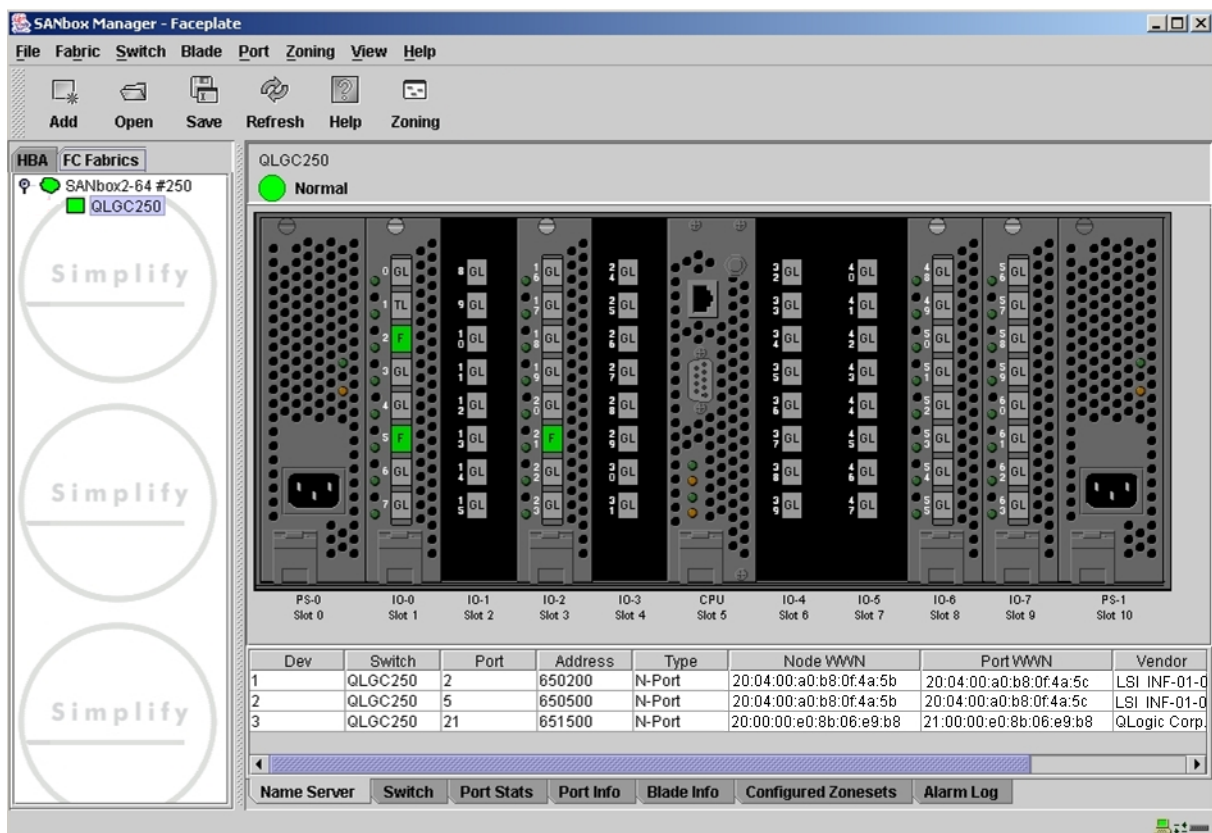
3. Select **Add Fabric** from the **Fabric** menu:



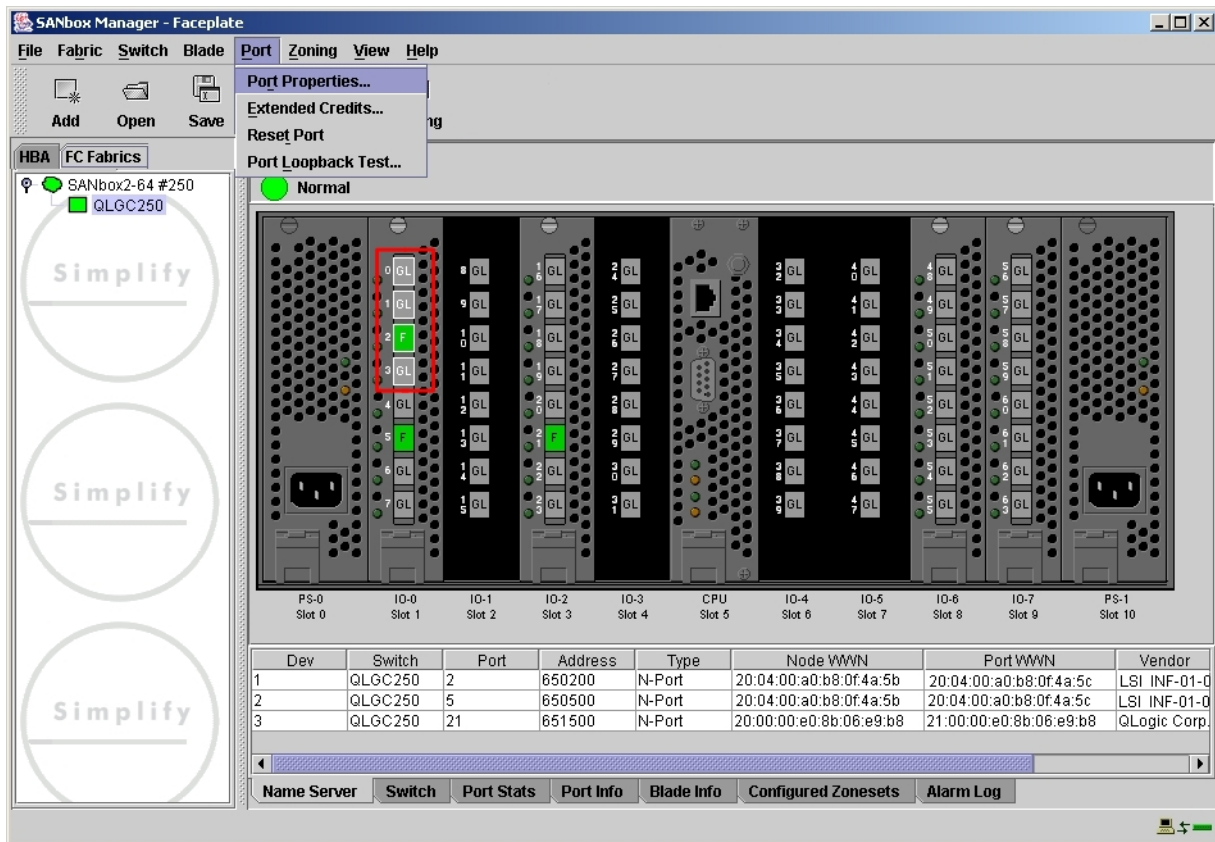
4. Enter a **Fabric View Name** and the **IP Address** of the switch; click **Add Fabric**:



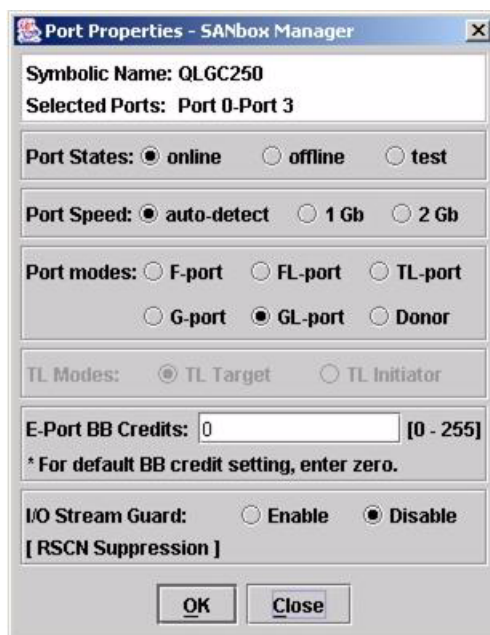
- Expand the **Fabric** in the left frame and select the switch you wish to configure:



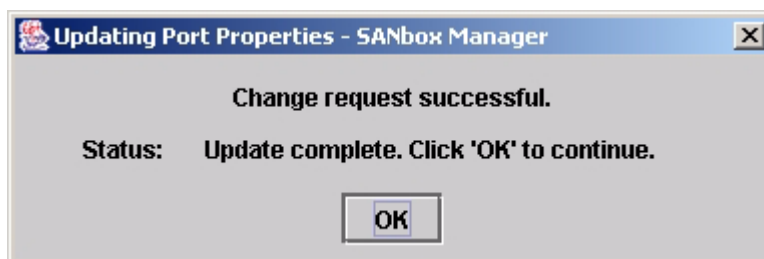
6. From the SANbox Manager – Faceplate dialog:
 - a. Select a single port or using the Ctrl/Shift key select a number of ports.
 - b. Select **Port Properties** from the **Port** menu.



- From the Port Properties dialog, select the **Port Speed** and **Port Mode** for the selected port(s):



- Click **OK** to close the status message:



Setting up HBA Persistent Binding

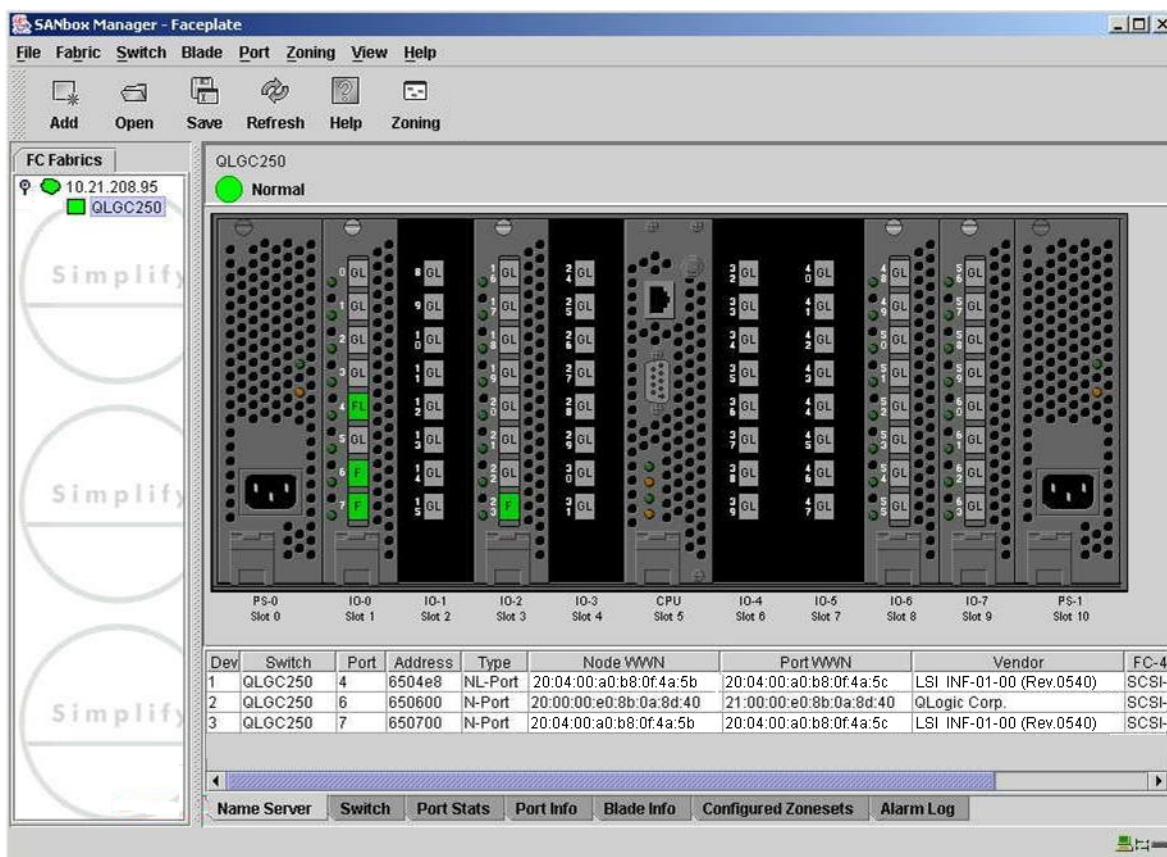
Persistent binding is an optional setup step to ensure that devices will be identified in a consistent fashion to the Operating System each time a device is discovered. For example, a device with WWN 50:05:0d:80:00:00:50:72 is detected by the Operating System as controller 2, target 2, LUN 0. Settings should also remain consistent after each reboot of the server.

Please see http://www.qlogic.com/support/home_resources.asp?id=76 for more information on persistent binding.

NOTE: Persistent binding is an optional step that must be completed after configuration of all SAN devices.

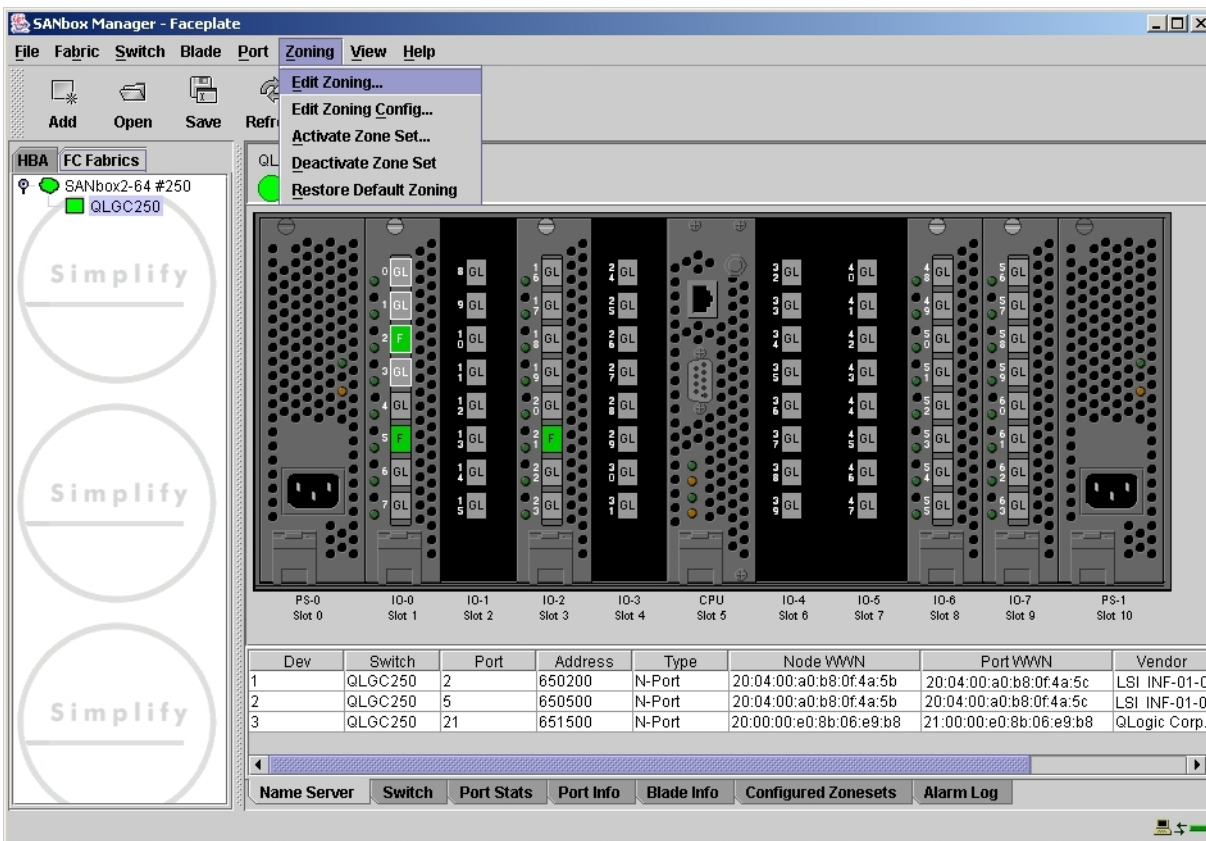
Connecting Cables

1. Connect the devices to the switch ports you have already configured.
2. Verify that the green Login LED is illuminated for each device.
3. Launch the SANSurfer Manager and connect to the SANbox2-64.
4. From the SANbox Manager-Faceplate dialog:
 - a. Select the **Name Server** tab in the lower right frame.
 - b. Verify that all devices are listed.

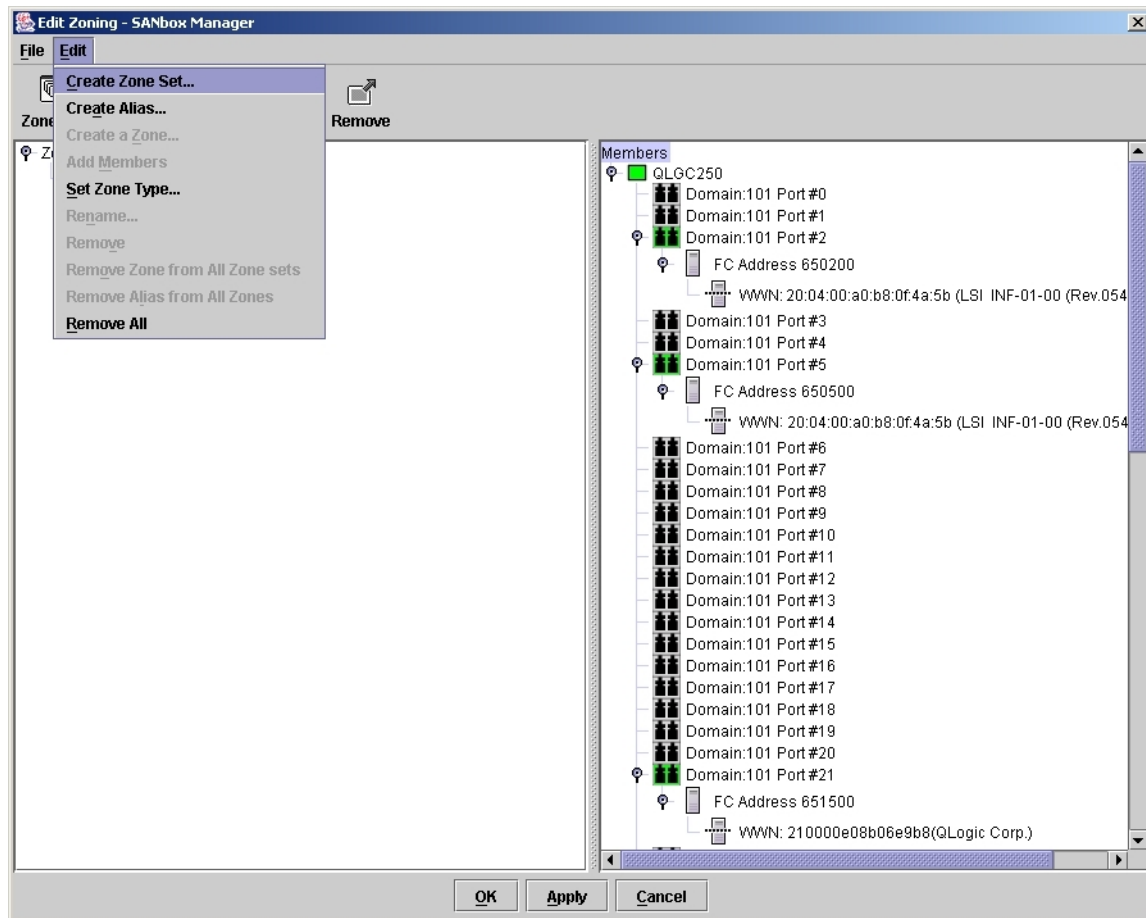


Configuring Zones

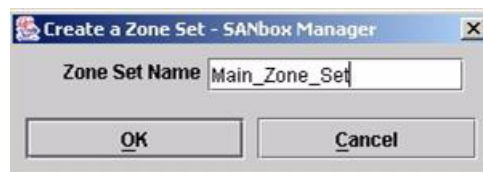
1. In the SANbox Manager – Faceplate dialog, select **Edit Zoning...** from the **Zoning** menu:



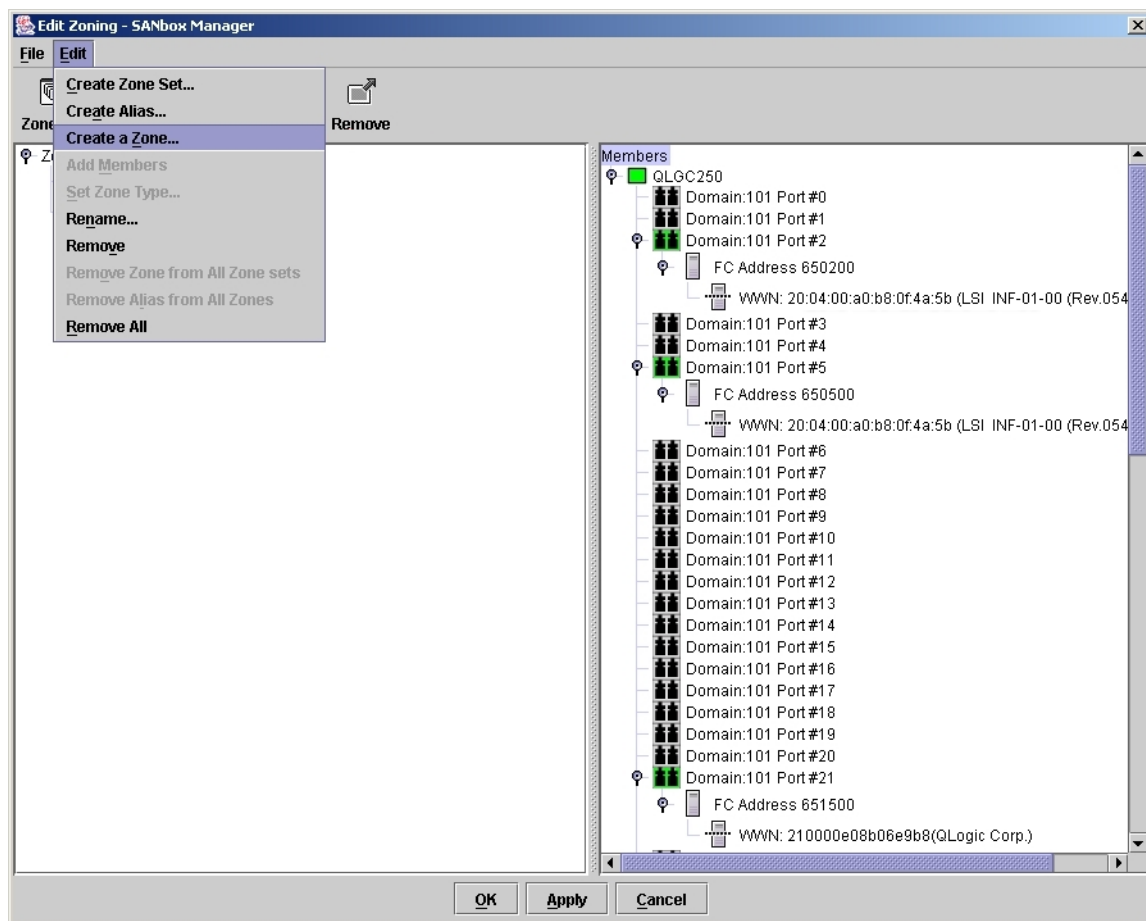
2. In the Edit Zoning dialog, select **Create Zone Set** from the **Edit** menu:



3. From the Create a Zone Set dialog, enter the name of the zone set and click **OK**:

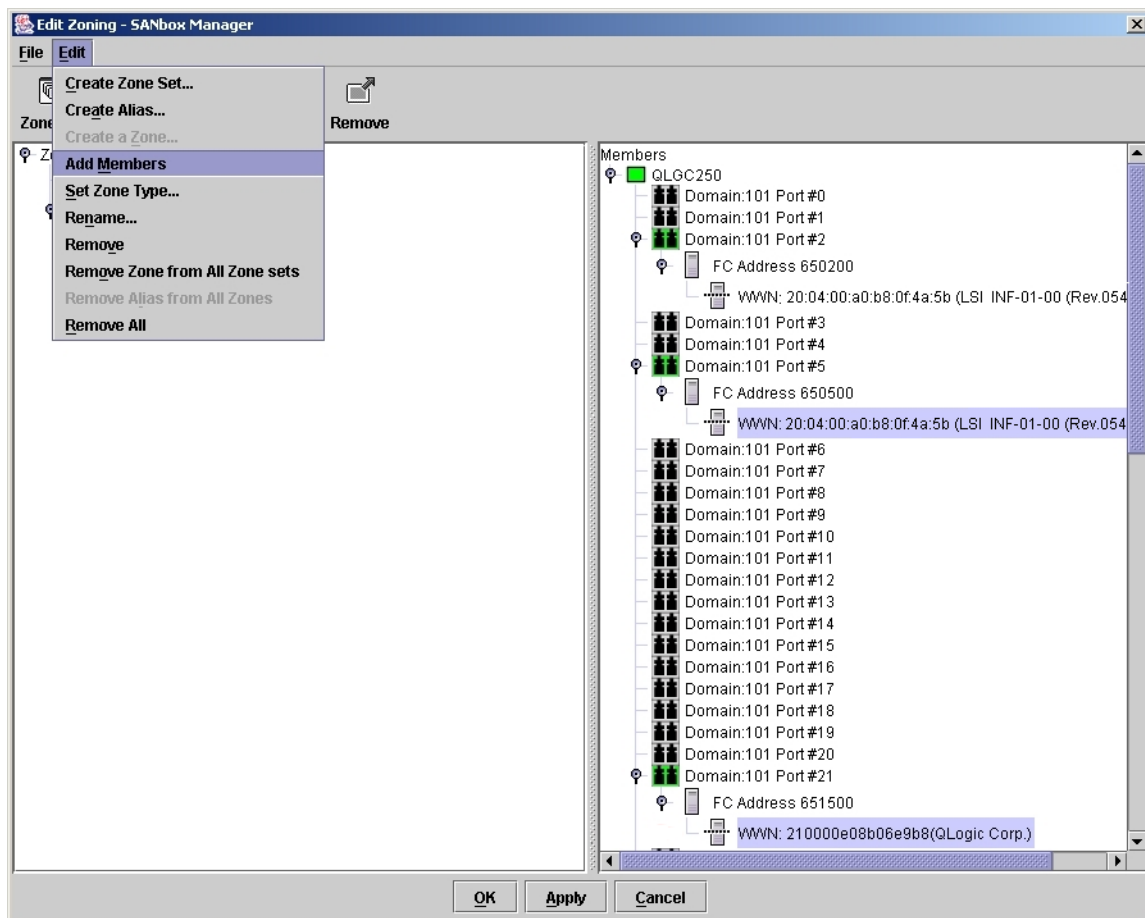


4. From the Edit Zoning dialog, click on the new zone set and select **Create a Zone...** from the **Edit** menu.



5. From the Create Zone dialog:
 - a. Click on the new zone.
 - b. Select the devices from the right frame.

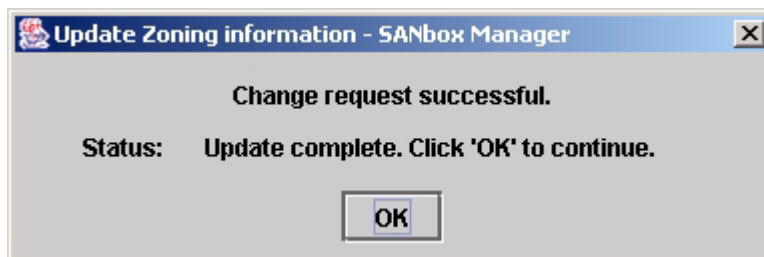
- c. Select **Add Members** from the **Edit** menu.
- d. Click **OK**.



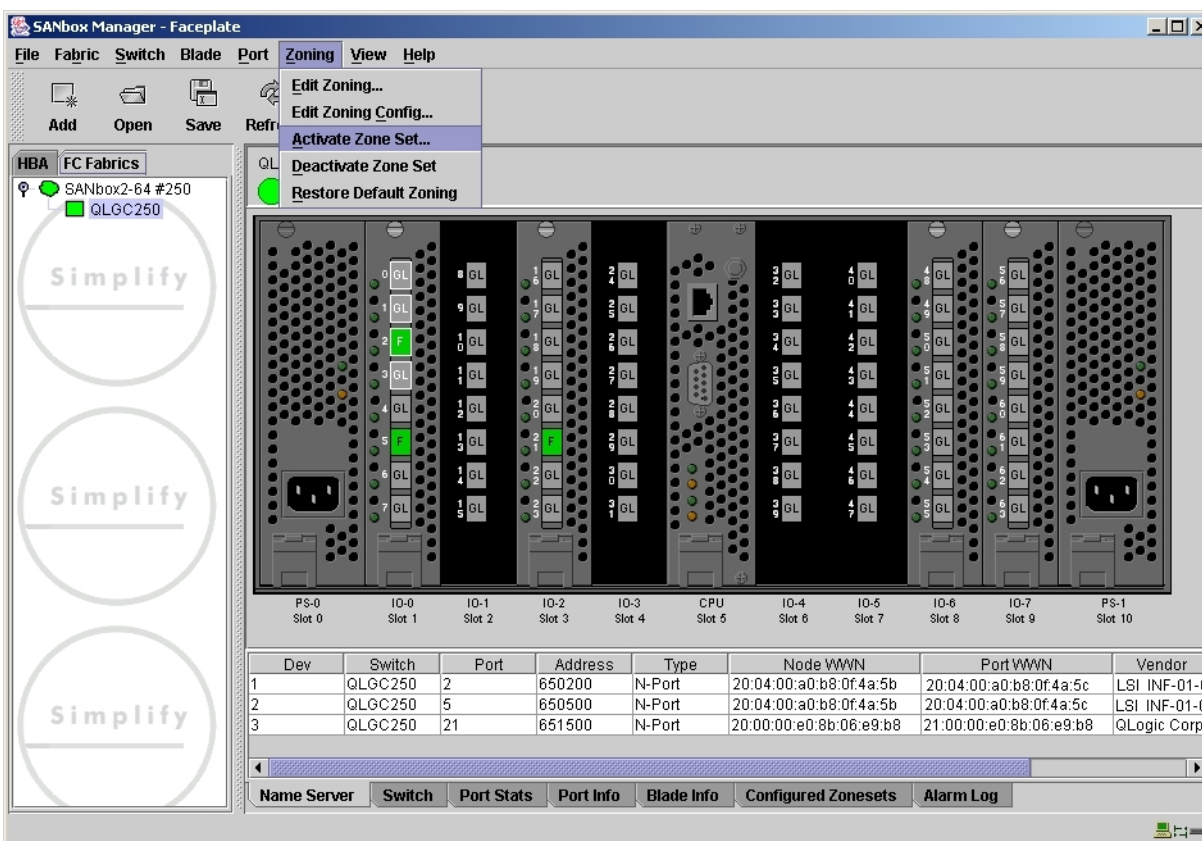
6. Click **OK** to the Zoning Data message:



7. Click **OK** to close the Update Zoning Information message:



8. In the SANbox Manager – Faceplate dialog, select **Activate Zone Set...** from the **Zoning** menu:



9. From the Activate Zone Set dialog, select the zone set you wish to use and click **Activate**:



10. Click **OK** to the Activate Zone Set message:



Testing Your SAN

After completing the storage configuration, the last step is to validate that your storage area network is set up and configured correctly. The following steps will provide you with a very basic test that ensures your storage is accessible by the host and data can be passed across the SAN.

You can use these tests for both the SANbox2 and SANbox 5000 Series switches:

- [Zone Verification](#)
- [Test Configuration](#)

Zone Verification

To verify zones in **Windows 2000 Server**:

1. Launch the Windows **Microsoft Management Console (MMC)** and click the **Device Manager** icon.
2. Verify that Disk Drives, Medium Changers, Tape Drive, and any other device zone with the host is present in the device tree.

NOTE: Components may appear under the **Unknown Devices** tree until you install the proper driver.

Test Configuration

To test configuration with **Windows 2000 Server** (Disk):

1. Launch the Windows **MMC** and click the **Disk Management** icon.
2. Verify that the correct number of LUN(s) is present.
3. Write signatures, partition and format the LUN(s) to meet your needs.
4. Copy data to the newly created partition and verify the data transferred correctly by using the DOS **Compare** command or a data comparison application of your choice.

Application Software Configuration

Prior to installing any application software, be sure that:

- Test systems are ready.
- Operating system software is configured and can see all devices.
- Fibre channel HBAs, tape library, and all the needed SAN infrastructure are available.
- Servers can ping one another on the LAN.

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SAN Configuration Guide LSI Storage

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Fortune's 100 Fastest Growing Companies
Network Computing
• Editor's Choice
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